DECLARATION FOR THE RECORD OF DECISION

SITE NAME AND LOCATION

PJP Landfill

Jersey City, Hudson County, New Jersey

STATEMENT OF BASIS AND PURPOSE

This decision document presents the selected remedial action for the PJP Landfill Site, which was chosen in accordance with the requirements of the Comprehensive Environmental Response, Compensation and Liability Act, as amended, and to the extent practicable, the National Oil and Hazardous Substances Pollution Contingency Plan. This decision document is based on the administrative record file for this Site.

The United States Environmental Protection Agency concurs with the selected remedy.

ASSESSMENT OF THE SITE

Actual or threatened releases of hazardous substances from the PJP Landfill Site, if not addressed by implementing the response action selected in this Record of Decision, may present an imminent and substantial threat to public health, welfare, or the environment.

DESCRIPTION OF THE SELECTED REMEDY

The selected remedy represents the first and only planned operable unit for the PJP Landfill Site. It addresses contaminated surface soils on the Site and groundwater contamination in the underlying shallow and deep aquifers.

The major components of the selected remedy include:

1. Removal of all known and suspected buried drum materials and associated visibly contaminated soil;
2. Capping of the remaining landfill area of the site with a multi-layer, modified solid waste cap in accordance with NJDEP Bureau of Landfill Engineering Guidance with gas venting;
3. Extension of the existing gravel lined ditch around the perimeter of the site to collect the surface water runoff;

4. A passive or active gas venting system installed in the new portion of the cap. (If an active system is deemed necessary, however, both areas will be included);
5. Site fencing and institutional controls (e.g., declaration of environmental restriction and public information program);
6. Quarterly inspections and maintenance, and a re-evaluation of the previously capped area;
7. Replacement of the Sip Ave ditch with an alternate form of drainage;
8. Quarterly ground water monitoring to evaluate the reduction of contaminant concentrations over time;
9. Modeling to demonstrate the effectiveness of the cap by predicting the impact of ground water leachate migrating to the Hackensack River from the landfill;
10. Because contamination levels in the ground water are above the Class IIA Ground Water Quality Criteria (GWQC), a Classification Exemption Area (CEA)/Well Restriction Area (WRA) will be established; and
11. Implementation of a wetlands assessment and restoration plan. (The wetlands assessment will be performed prior to implementation of any of the remedial actions).

DECLARATION OF STATUTORY DETERMINATIONS

The selected remedy is protective of human health and the environment, complies with Federal and State requirements that are legally applicable or relevant and appropriate to the remedial action, and is cost-effective. The remedy utilizes permanent solutions and alternative treatment (or resource recovery) technologies to the maximum extent practicable, and it satisfies the statutory preference for remedies that employ treatment which reduces toxicity, mobility, or volume as their principal element.

Because this remedy will result in hazardous substances remaining on the Site above health-based levels (soil will be capped over), a review will be conducted within five years after commencement of the remedial action to ensure that the remedy continues to provide adequate protection of human health and the environment. This review will include an evaluation of the data and information obtained in connection with remedial components 6, 8, and 9 above, as well as other appropriate components of the selected remedy.

Robert C. Shinn Jr.
Commissioner

9/28/95
Date

RECORD OF DECISION

PJP Landfill Site

Jersey City, Hudson County, New Jersey

New Jersey Department of Environmental Protection
Site Remediation Program
Trenton, New Jersey

SEPTEMBER 28, 1995

DECLARATION FOR THE RECORD OF DECISION

SITE NAME AND LOCATION

PJP Landfill

Jersey City, Hudson County, New Jersey

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Robert C. Shinn Jr.
Commissioner

9/28/95
Date

RECORD OF DECISION
DECISION SUMMARY

PJP Landfill Site

Jersey City, Hudson County, New Jersey

New Jersey Department of Environmental Protection
Trenton, New Jersey

RECORD OF DECISION
RESPONSIVENESS SUMMARY

PJP Landfill Site

Jersey City, Hudson County, New Jersey

New Jersey Department of Environmental Protection
Site Remediation Program
Trenton, New Jersey

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ATTACHMENTS

SITE NAME, LOCATION, AND DESCRIPTION

The PJP Landfill Superfund Site is an inactive landfill located at 400 Sip Avenue, Jersey City (see figure 1). The Site occupies approximately 87 acres in Jersey City, Hudson County, New Jersey, and is identified on the Jersey City tax map (1977) as block 1639.1, lots 2A, 3, 4C, 5C, 7D; block 1639.2, lots 1C, 5C, 7 and 7E; block 1627.2 lot 1P; block 1627.1 lots 5A, 6A and parts of 2A, 3B and 4B. The Site is bordered on the north and west by the Hackensack River and on the southeast by Truck Routes 1 and 9. A recycling facility and a warehouse border the northeast side of the Site. The southwest side of the Site is boarded by several commercial trucking terminals. Multiple dwelling housing units are located northeast and southeast of the Site. The Pulaski Skyway, an elevated highway, passes over the Site. The Sip Avenue Ditch bisects the Site and conveys run-off from the PJP Landfill and Jersey City storm water/sewer into the Hackensack River (see figure 2).

SITE HISTORY AND ENFORCEMENT ACTIVITIES

The Site was originally a salt meadow, a portion of which was condemned in 1932 for the construction of the Pulaski Skyway. The PJP Landfill Company operated a commercial landfill at the Site, accepting chemical and industrial waste from approximately 1970 to 1974.

From 1970 to 1985, subsurface fires (on the currently capped 45 acre area) which were attributed to spontaneous combustion of subsurface drums and decomposition of landfill materials, frequently burned at a 45-acre portion of the PJP Landfill and emitted large amounts of smoke. In 1977, the NJDEP issued an order to the PJP Landfill Company to properly cover and grade the landfill, and to remove wastes in contact with the Hackensack River and the Sip Avenue Ditch. The PJP Landfill Company did not comply with the order.

Throughout the early 1980s, NJDEP and the Hudson Regional Health Commission inspected the Site and conducted sampling and air monitoring. In December 1982, the Site was included on the EPA's National Priorities List (NPL), which identifies hazardous waste Sites that pose a significant threat to public health or the environment.

During 1985 and 1986, NJDEP conducted an Interim Remedial Measure (IRM) to extinguish the fires and cap the 45 acre area. The IRM resulted in the extinguishing of fires; excavation and recompaction of approximately 1,033,000 cubic yards of material; and the removal of grossly contaminated soils, cylinders and drums containing hazardous materials on approximately 45 of the 87 acres. These hazardous materials were properly disposed of off Site at secure landfills or hazardous waste incinerators. A fire break trench was installed and the 45 acre area was regraded, capped and seeded. A gas venting system was also installed on the 45-acre portion of the landfill. All subsurface fires have been out since the completion of the IRM in May 1986.

The NJDEP contracted ICF Technology, Inc. (ICF) in 1988 to perform an RI/FS on the entire 87 acres of the landfill. The Remedial Investigation (RI) was completed by ICF in 1990. The RI identified areas and levels of contamination at the Site. The study included a geographical investigation and a shock-

sensitive drum investigation to determine the density and condition of buried drums, extent of landfill material, the shock sensitivity of drums, and drum markings. An FS was also performed, which developed and evaluated various remedial alternatives for addressing Site contamination.

In the summer of 1993, NJDEP implemented a plan to assist in the evaluation of the current impact the Site was having on the adjacent Hackensack River and on the deeper aquifer of concern beneath the fill material. The sampling effort consisted of the sampling of three shallow and three deep monitoring wells, and six surface water and sediment locations. Water and sediment samples collected from the Hackensack River were obtained upstream and downstream from the Site. Water and sediment samples from the Sip Avenue Ditch were obtained from the Ditch adjacent to Routes 1 and 9 and at the confluence of the ditch with the Hackensack River. The samples were analyzed for organic and inorganic chemical parameters. In addition, a series of bioassay (mysid shrimp chronic toxicity tests) were preformed using water collected from the Hackensack River, the Sip Avenue Ditch, and at the sediment sample locations and in the waters of the two wells with the highest levels of contamination was performed.

HIGHLIGHTS OF COMMUNITY PARTICIPATION

The RI report, FS report, and the Proposed Plan for the Site were released to the public for comment on August 2, 1994. These documents were made available to the public in the administrative record file at the NJDEP file room in, 401 East State Street, Trenton, NJ and the information repositories at:

Jersey City Public Library
472 Jersey Avenue
Jersey City, NJ 07302
(201)547-4516

Jersey City Municipal Building
Engineering Division
280 Grove Street
Jersey City, NJ 07302
(201)547-6852

On August 18, 1994, NJDEP conducted a public meeting at the Jersey City Municipal Building to inform local officials and interested citizens about the Superfund process, to discuss the findings of the RI and FS and the proposed remedial activities at the Site, and to respond to any questions from area residents and other attendees.

NJDEP responses to the comments received at the public meeting, and in writing during the public comment period, are included in the Responsiveness Summary section of this Record of Decision.

SCOPE AND ROLE OF RESPONSE ACTION

This ROD will address cleanup remedies for the Sip Avenue Ditch sediment, air and landfilled material which includes areas of buried drums and surrounding contaminated soil. A monitoring program will be established to determine whether additional actions may be necessary to mitigate the leaching of contaminants to ground water and surface water as well as to the Hackensack River. If a significant adverse impact is found, NJDEP and EPA will evaluate remedial alternatives and select an appropriate remedy in accordance with CERCLA and the NCP.

SUMMARY OF SITE CHARACTERISTICS

Site Geology and Hydrology

The PJP Landfill Site lies in the Piedmont physiograph province of Northeastern New Jersey. The bedrock of the Piedmont Lowlands consists of igneous and sedimentary rocks. The bedrock underlying the Site is the Brunswick Formation. This formation consists of fluvial and lacustrine reddish brown shales and some fine grained sandstone.

The Site is located on man-made fill deposits which are approximately 10 to 30 feet thick. The fill material is underlain by a discontinuous layer of peat. Under the peat layer is a layer of sand and silt. The bedrock at the landfill is approximately 60 to 90 feet below the surface.

The principal source of ground water in the area lies within the rocks of the Brunswick Formation. Ground water, which flows in a westwardly direction, is not used for potable water supply within the lower Hackensack Basin. However, due to industrial and commercial nature of the area it appears that the ground water is used for some commercial and industrial purposes. The area near the PJP Landfill is served by the Jersey City municipal water supply, which is the Boonton Reservoir.

Nature and Extent of Contamination

The RI identified contaminants above NJDEP current cleanup criteria in surface soils, subsurface soils (excluding test pits), test pits, sediments from the Sip Avenue Ditch, and air. The cleanup criteria, although not promulgated, are currently used in lieu of standards.

Soil

Arsenic was detected in the surface soils samples in concentrations greater than the NJDEP Soil Cleanup Criteria of 20 parts per million (ppm). In the subsurface soils (excluding the test pits which are discussed later in this Record of Decision), the following contaminants were detected at levels exceeding the cleanup criteria: Benzene (maximum concentration detected 1.6 ppm), bis(2-ethylhexyl)phthalate (maximum concentration detected 180 ppm) and chlorobenzene (maximum concentration detected 2.92 ppm).

Chemicals were detected more frequently, and in higher concentrations, in the test pits than were detected in samples from other media. Bis(2-ethylhexyl)phthalate (maximum concentration detected 33,100 ppm) and petroleum hydrocarbons were the predominant organic chemicals found in the subsurface soils of those that exceed the current NJDEP subsurface soil standards. Other predominant organic chemicals detected in the soils sampled from the test pits that exceed the NJDEP impact to ground water soil cleanup criteria are the following: benzene (maximum concentration detected 250 ppm), dieldrin (maximum concentration detected 200 ppm), tetrachloroethene (maximum concentration detected 41 ppm), and total xylenes (maximum concentrations detected 3900 ppm). Carcinogenic and non-carcinogenic polycyclic aromatic hydrocarbons (PAHs) and inorganic chemicals (metals) were also detected frequently in the subsurface soils.

Sip Avenue Ditch

The Sip Avenue Ditch sediment samples were compared to the National Oceanographic and Atmospheric Administration (NOAA) sediment screening guidelines. This guidance sets criteria for contaminants which may have potentially harmful biological effects to aquatic life. Sediment contaminants found in the Sip Avenue Ditch exceeded these screening guidelines. The highest concentrations found were total PAH (14.8 ppm for carcinogenic PAH; 30.1 ppm for noncarcinogenic PAH), antimony (93.8 ppm), cadmium (6.3 ppm), chromium (771 ppm), copper (34,000 ppm), lead (406 ppm), mercury (5.1 ppm), nickel (1,260 ppm), and zinc (9,830 ppm).

Landfill Gas Vent Samples

Landfill gas vent sample data obtained during the Remedial Investigation was used to approximate the total amount of contaminants discharged from the gas vent system in terms of pounds per hour. Eight of the forty-nine existing vents were sampled on three separate occasions, and used as representative vents for the entire system. The maximum flow rate from the forty-nine vents was used to calculate potential discharges (8.73 cubic feet per minute/cfm) and the maximum contaminant concentrations from the three sample rounds was used for each contaminant.

Discharge numbers were calculated for total emissions and toxic emissions. Using the average and maximum contaminant concentrations for the eight landfill gas vents, typical landfill emissions and the worst case scenario emissions were determined. The total emissions average of .43 lbs/hr, and maximum of 1.5 lbs/hr, respectively, are within the acceptable/allowable limit of 1.5 lbs/hr. Toxic emissions average of .07 lbs/hr is also within the acceptable/allowable limit of .1 lbs/hr while the toxic emissions maximum of .27 lbs/hr is slightly above the acceptable/allowable limit of .1 lbs/hr.

The NJDEP 1993 Sampling Effort

The monitor well analyses indicated that 11 compounds were detected in the three (3) ground water monitor wells at levels slightly above New Jersey's Ground Water Quality Criteria. Hackensack River water and sediment samples were collected upstream and downstream of the Site. Surface water samples obtained from the river indicated the presence of inorganics both upstream and downstream from the Site, such as iron, aluminum, copper and zinc. Sediment samples collected from the river indicated the presence of volatile organic compounds, semi-volatile organic compounds, pesticides, PCBs, and inorganics both upstream and downstream from the Site. Predominant chemicals detected in the sediments were polycyclic aromatic hydrocarbons (maximum concentration detected approximately 25 ppm), PCBs (maximum concentration detected approximately 360 ppb), lead (maximum concentration detected approximately 222 ppm), and mercury (maximum concentration detected approximately 2.7 ppm).

Contamination was also present in the Sip Ave ditch, both adjacent to Routes 1 & 9 and at the confluence of the ditch with the river. The ditch water and sediment samples adjacent to the highway were more contaminated than the sample obtained from the confluence of the ditch with the river. Chemicals detected in the water samples included volatile organics such as tetrachloroethene (detected at 44 ppb) and inorganics such as lead and zinc. Chemicals detected in the sediment samples included tetrachloroethene

(detected at approximately 10 ppb), toluene (detected at approximately 4 ppb), numerous polycyclic aromatic hydrocarbons, and inorganics such as copper, lead and zinc.

All four (4) of the bioassay sampling locations in the river, the two monitor well sample locations, and the Sip Avenue Ditch location from the confluence of the ditch and the river showed significant mortality. The sampling location with the lowest percent mortality was from the Sip Avenue Ditch adjacent to Routes 1 and 9. This data indicates that potential adverse impacts on biota by these contaminated waters is likely occurring.

The Bedrock Aquifer Well sampling results indicate that all three well results are below New Jersey Ground Water Quality Standards. The sampling results indicate that none of the contaminants found in the wells exceed NJDEP's Ground Water Quality Criteria for Volatile Organics, Semi-Volatile Organics, and Pesticides.

SUMMARY OF SITE RISKS

Based upon the results of the RI, a baseline risk assessment was conducted to estimate the risks associated with current and future Site conditions. The baseline risk assessment estimates the human health and ecological risk which could result from the contamination at the Site if no remedial action were taken. The results from the 1993 NJDEP sampling effort were not incorporated into the baseline risk assessment for the Site, since the RI report predated the 1993 sampling event.

The following summarizes the finding of the Risk Assessment.

Human Health Risk Assessment

A four step process is utilized for assessing site-related human health risks for a reasonable maximum exposure scenario: *Hazard Identification* - identifies the contaminants of concern at the Site based on several factors such as toxicity, frequency of occurrence, and concentration; *Exposure Assessment* - estimates the magnitude of actual and/or potential human exposures, the frequency and duration of these exposures, and the pathways by which humans are potentially exposed (e.g., ingesting contaminated soil/water); *Toxicity Assessment* - determines the types of adverse health effects associated with chemical exposures, and the relationship between magnitude of exposure (dose) and severity of adverse effects (response); and *Risk Characterization* - summarizes the combined output of the exposure and toxicity assessments to provide a quantitative (e.g., one-in-a-million excess cancer risk) assessment of site-related risks. Normally, a baseline risk assessment evaluates the risk posed by a site in the absence of remediation. In the case of PJP Landfill, an Interim Remedial Measure has already been implemented prior to evaluating site-wide risk.

EPA conducted a baseline risk assessment to evaluate the potential risk to human health and the environment associated with the PJP Landfill Site in its current state. The Risk Assessment focused on contaminants in the soil,

ground water, surface water, sediment, and air which are likely to pose significant risks to human health and the environment. A summary of the contaminants of concern in sampled matrices is provided in Table 5-15 for human health and the environmental receptors, respectively. The exposure pathways and populations evaluated are in Table 5-17. A total of nine exposure pathways were assessed under possible on-site current and future land-use conditions. The plausible maximum and average case scenarios were evaluated.

Under current EPA guidelines, the likelihood of carcinogenic (cancer-causing) and noncarcinogenic effects due to exposure to Site chemicals are considered separately. It was assumed that the toxic effects of the site-related chemicals would be additive. Thus, carcinogenic and noncarcinogenic risks associated with exposures to individual compounds of concern were summed to indicate the potential risks associated with mixtures of potential carcinogens and noncarcinogens, respectively.

Noncarcinogenic risks were assessed using a Hazardous Index (HI) approach, based on a comparison of expected contaminant intakes and safe levels of intake (Reference Doses). Reference doses (RfDs) have been developed by EPA for indicating the potential for adverse health effects. RfDs, which are expressed in units of milligrams/kilogram-day (mg/kg-day), are estimates of daily exposure levels for humans which are thought to be safe over a lifetime (including sensitive individuals). Estimated intakes of chemicals from environmental media (e.g., the amount of a chemical ingested from contaminated drinking water) are compared to the RfD to derive the hazard quotient for the contaminant in the particular medium. The HI is obtained by adding the hazard quotients for all compounds across all media that impact a particular receptor population.

An HI greater than 1.0 indicates that the potential exists for noncarcinogenic health effects to occur as a result of site-related exposures. The HI provides a useful reference point for gauging the potential significance of multiple contaminant exposures within a single medium or across media. The reference doses for the compounds of concern at the Site are presented in Table 5-19. A summary of the noncarcinogenic risks associated with these chemicals across various exposure pathways is found in Tables 5-24,5-25,5-26,5-27,5-29,5-30,5-31,5-35,5-36,5-37 and 5-39. The results of the baseline risk assessment indicated that the greatest risk associated with the Site under current conditions is the incidental ingestion and dermal absorption of chemicals in sediment by trespassing children wading in the Sip Avenue Ditch. The carcinogenic risk for children was estimated to be 4×10^{-5}, which is within acceptable EPA guidelines.

For incidental ingestion/dermal absorption of Sip Ave Ditch sediments, the HI was calculated to be four. This was based on the plausible maximum scenario. Therefore noncarcinogenic effects may occur from this exposure route. Under an average case scenario, the HI is less than one.
Potential carcinogenic risks were evaluated using the cancer slope factors developed by EPA for the contaminants of concern. Cancer slope factors (SFs) have been developed by EPA's Carcinogenic Risk Assessment Verification Endeavor for estimating excess lifetime cancer risks associated with exposure

to potentially carcinogenic chemicals. SFs, which are expressed in units of $(mg/kg\text{-}day)^{-1}$, are multiplied by the estimated intake of potential carcinogen, in mg/kg-day, to generate an upper-bound estimate of the excess lifetime cancer risk associated with exposure to the compound at that intake level. The term "upper bound" reflects the conservative estimate of the risks calculated from the SF. Use of this approach makes the underestimation of the risk highly unlikely. The SF for the compounds of concern are presented in Table 5-19.

A qualitative risk assessment was performed for future land-use conditions. Although not likely, it is possible that land use at the Site could change in the future, resulting in additional exposure pathways that do not exist under current land-use conditions. The most plausible land-use change would be development of the landfill area as an industrial/commercial area. If the area were developed, on-site construction workers could be exposed via direct contact with contaminated sediments, subsurface soil, and materials in test pits. Generally, the concentrations of chemicals detected in test pits and subsurface soils are substantially higher than in sediments. Based on the substantially higher chemical concentrations in the subsurface soil and test pits, some of which are potentially carcinogenic, future workers exposed to these subsurface contaminants could be at significant risk. Inhalation exposures are estimated to be approximately equal to those estimated for trespassing children. For long-term exposures, this risk would probably be greater than the 10^{-4} to 10^{-6} range.

Environmental Risk Assessment

The Environmental Assessment provides a qualitative evaluation of the actual or potential impacts associated with the Site on plants and animals (other than people or domesticated species). The primary objectives of this assessment were to identify the ecosystems, habitats, and populations likely to be found at the Site and to characterize the contaminants, exposure routes and potential impacts on the identified environmental components. The environmental assessment evaluated potential impacts associated with chemicals in the surface soil, surface water (including chemicals released to surface water from ground water) and sediment. Potential exposures evaluated were terrestrial plants, terrestrial wildlife, and aquatic life.

The Environmental Assessment identified several endangered species and sensitive habitats in the vicinity of the Site. The Hackensack River is considered critical habitat for the short-nosed sturgeon, which is a State and federal endangered species. The Site is also within the current or historical range of several other State endangered or threatened species that inhabit coastal areas and/or marshes, including the Atlantic sturgeon, Atlantic tomcod, pied-billed grebe, great blue heron, northern harrier, Henslow's sparrow, short-billed marsh wren, and osprey.

Estuarine intertidal wetlands occur along the Hackensack River and the Sip Avenue Ditch, which are tidally influenced in association/with the Hackensack River. A palustrine emergent scrub/shrub wetland occurs in the southeast corner of the Site adjacent to the entrance road and Routes 1 and 9. Due to

some areas receiving less fill material than others, depressed areas have formed, leaving an appearance of wetland like features.

The environmental assessment is summarized as follows:

Plants-- Plants can be exposed to chemicals in surface soil. Chemical-related impacts in plants are not expected to be significant. If chemical-related impacts are occurring, they are most likely limited to localized source areas such as the drum disposal area, since surface soil contamination is not believed to be widespread at the Site. Impacts in these isolated areas would be expected to have minor impacts on the plant community and habitat quality of the entire PJP Site. Chemical-related impacts in plants are most likely insignificant compared to other current and past (non-chemical) stresses on the plant community at the PJP Site, such as past grading and filling at the Site.

Terrestrial wildlife -- Potential impacts were evaluated for wildlife exposed to chemicals of potential concern. Some species could use the Sip Avenue Ditch or Hackensack River for drinking water, however, exposure in these species is not expected to be significant given the availability of other water sources nearby and the relatively large foraging area of these species. None of the chemicals of potential concern detected in surface water are expected to be acutely or chronically toxic at the low levels of exposure potentially experienced by wildlife.

Aquatic life -- Potential impacts on aquatic life were evaluated for chemicals in surface water and sediment. Surface water concentrations were compared with ambient water quality criteria developed by EPA or lowest-observed-effects levels. Sediment concentrations were compared with toxicity values derived from the available literature. There is a potential for food chain effects to occur via predation on aquatic species, since several of the contaminants of concern bioconcentrate (e.g., cadmium, mercury). Surface water and sediment concentrations for several chemicals in the Sip Avenue Ditch and in the Hackensack River exceeded their respective toxicity values, suggesting that aquatic life impacts may be occurring at the Site.

In summary, the environmental assessment concluded that chemical contamination from the Site is not expected to have significant impacts on plants or terrestrial wildlife, but may be impacting aquatic life.

Uncertainties

The procedures and inputs used to assess risks in this evaluation, as in all such assessments, are subject to a wide variety of uncertainties. In general, the main sources of uncertainty include:

- environmental chemistry sampling and analysis
- environmental parameter measurement
- fate and transport modeling
- exposure parameter estimation
- toxicological data

Uncertainty in environmental sampling arises in part from the potentially uneven distribution of chemicals in the media sampled. Consequently, there is significant uncertainty as to the actual levels present. Environmental chemistry-analysis error can stem from several sources including the errors inherent in the analytical methods and characteristics of the matrix being sampled.

There are also uncertainties in the risk assessment because the PJP Site is located in an industrial area. The Sip Avenue Ditch receives some runoff from Jersey City and during large storm events has received overflow sewage from the city. Regional pollution has resulted in the state prohibiting swimming or other consumptive uses of the Hackensack River.

Uncertainties in the exposure assessment are related to estimates of how often an individual would actually come in contact with the chemical of concern, the period of time over which such exposure would occur, and in the models used to estimate the concentrations of the chemicals of concern at the point of exposure.

Uncertainties in toxicological data occur in extrapolating both animals to humans and from high to low doses of exposure, as well as from the difficulties in assessing the toxicity of a mixture of chemicals. These uncertainties are addressed by making conservative assumptions concerning risk and exposure parameters throughout the assessment. As a result, the Risk Assessment provides upper-bound estimates of the risks to populations near the Site, and is highly unlikely to underestimate actual risks related to the Site.

More specific information concerning public health risk, including a quantitative evaluation of the degree of risk associated with various exposure pathways, is presented in the Risk Assessment Report.

Actual or threatened releases of hazardous substances from this Site, if not addressed by implementing the response action selected in the ROD, may present an imminent and substantial endangerment to the public health, welfare, or the environment.

REMEDIAL ACTION OBJECTIVES

Remedial Action Objectives are specific goals to protect human health and the environment. These objectives are based on available information, applicable or relevant and appropriate requirements (ARARs), and risk-based levels established in the risk assessment. The following remedial action objectives were established for cleanup activities at the Site:

- Eliminate exposure to contaminated sediments in the Sip Avenue Ditch.
- Prevent additional contaminant influx into the ground water via infiltration of rain water.
- Removal of contaminant sources that may impact ground water.

- Evaluate if future actions are necessary to mitigate the leaching of Site contaminants into the Hackensack River through the monitoring and modeling to check the effectiveness of the remedy. If a significant adverse impact is found, NJDEP and EPA will evaluate remedial alternatives and select an appropriate remedy in accordance with CERCLA and the NCP.

DESCRIPTION OF REMEDIAL ALTERNATIVES

The Comprehensive Environmental Response, Compensation, and Liability Act, as amended (CERCLA), requires that each selected Site remedy be protective of human health and the environment, be cost effective, comply with other applicable or relevant and appropriate requirements, and utilize permanent solutions, alternative treatment technologies, and resource recovery alternatives to the maximum extent practicable. In addition, the statute includes a preference for the use of treatment as a principal element for the reduction of toxicity, mobility, or volume of the hazardous substances.

The FS evaluates in detail several remedial alternatives for addressing the contamination associated with the PJP Landfill Site. These alternatives are:

Alternative LF-1: No Action
Alternative LF-2: Minimal Action
Alternative LF-3: Soil Cover
Alternative LF-4: Modified NJDEP Solid Waste Cap (Extending Existing Cap)
Alternative LF-5: NJDEP Hazardous Waste Cap
Alternative LF-6: RCRA Hazardous Waste Cap - Incorporating Existing Cap
Alternative LF-7: New RCRA Hazardous Waste Cap

The following two options are applicable to Alternatives LF-3 through LF-7:

OPTION 1: No Drum Removal
OPTION 2: Drum Removal (All known Buried Drum Areas and associated Soils)

As part of Alternatives LF-3 through LF-7: the Sip Avenue Ditch will be replaced with an alternative form of drainage, in order to maintain the integrity of the landfill cap and channel surface water runoff. Design details related to the Sip Avenue Ditch will be resolved in the remedial design phase of the Project. Alternatives will address issues such as protectiveness to ecological receptors, the fate of stormwater runoff, and the effectiveness in preventing contaminant migration to the Hackensack River. Potential alternatives include, but are not limited to, excavation of sediments and placement under the cap, burial in place, or some other form of containment or disposal.

In order to comply with federal wetland ARARs, the remedial design will also include: (a) a wetlands assessment to determine what wetlands were impacted/disturbed by contamination or remedial activities, and (b) a wetlands restoration plan to mitigate those areas found to have been impacted. The

assessment will be conducted and the restoration plan prepared prior to remedial activities.

Under Alternative LF-2, LF-3, and LF-4, the existing landfill gas venting system will be sampled during the design phase to determine compliance with current State and Federal air quality standards. If, at that time, air emissions are not in compliance with the accepted maximum limits for Total Volatile Organics, the appropriate measures will be incorporated into the design phase to bring the Site into compliance with air requirements.

For alternatives LF-5, LF-6, and LF-7, the design phase will include a new landfill gas venting system that will be designed (active or passive) to comply (including treatment, if necessary) with State and Federal air quality standards.

In addition, because contamination levels in the ground water are above the Class IIA, Ground Water Quality Criteria (GWQC), each alternative includes a Classification Exemption Area (CEA)/Well Restriction Area (WRA).

This ROD presents alternatives, which are described in greater detail below. Implementation times given include the time necessary to construct and implement the remedy but do not include the time required for design or award of a contract for the performance of the work.

ALTERNATIVE LF-1: NO ACTION

Estimated Capital Cost: None
Annual Operation and Maintenance: None
Estimated Present Worth: None
Estimated Implementation Time: None

The National Oil and Hazardous Substances Pollution Contingency Plan (NCP) and CERCLA require the evaluation of a No Action alternative to serve as a point of comparison with other remedial action alternatives. Under this alternative, no action would be taken to contain, treat, or control the contamination at the Site. The subsurface soil contamination would decrease over a long period of time through natural processes such as flushing and attenuation. This alternative does not include any measures to restrict access to the Site. Essentially, the Site would remain the same as it is today. Regular monitoring and a five year review to re-evaluate this alternative would be performed.

ALTERNATIVE LF-2: MINIMAL ACTION
Estimated Capital Cost: $209,000
Annual Operation and Maintenance: $105,000
Estimated Present Worth: $752,000
Estimated Implementation Time: None

Under this alternative, no remedial action would be performed at the Site to contain, treat, or control the contamination at the Site. However, institutional controls, such as deed restrictions to restrict future use of the Site and public information programs to increase public awareness of potential problems associated with the Site, would be implemented. In addition, although most of

the Site is already fenced, the existing fence would be extended to restrict access and reduce the potential for direct exposure to sediment contamination. Long-term monitoring of soil, sediment and air quality would be performed for a minimum of five years to evaluate the migration of contaminants from the Site and to monitor the effects of natural attenuation.

A Site review would be instituted at the end of five years in order to reevaluate Site conditions. This includes an evaluation of what additional measures, if any, should be implemented based on the Site conditions.

ALTERNATIVE LF-3: SOIL COVER

Estimated Capital Cost: $16,368,000
Annual Operation and Maintenance: $291,000
Estimated Present Worth: $17,716,000
Estimated Implementation Time: 6 months

As described earlier, a 45-acre portion of the landfill was already excavated and capped with one foot of clay and one foot of soil during the completion of the IRM in 1986. Under this alternative, a two foot soil cover would be installed over the remaining, uncapped 42-acre area. The proposed soil cover design includes installation of a top soil layer over the uncapped area and vegetation to prevent soil erosion. Existing gas vents would be sampled and analyzed annually to monitor the gas releases to the atmosphere from the Site. If the gas poses a threat, treatment options would be developed and implemented. In addition, institutional controls and Site fencing would be implemented as described for Alternative LF-2 above.

The soil covered area would require quarterly inspections and maintenance, and a review and reevaluation of Site conditions after five years.

ALTERNATIVE LF-4: MODIFIED NJDEP SOLID WASTE CAP (Extending Existing Cap)

Estimated Capital Cost: $22,022,000
Annual Operation and Maintenance: $369,000
Estimated Present Worth: $23,707,000
Estimated Implementation Time: 1.5 years

As described earlier, a 45-acre portion of the landfill was already excavated and capped with one foot of clay and one foot of soil during the IRM. Under this alternative, the remaining 42-acre area, under the Pulaski Skyway on the north side of the Sip Ave Ditch, would be capped with a multi-layer, modified solid waste type cap. The cap may combine several layers of cover materials, such as clean sand, soil and an impervious layer, such as a High Density Polyethylene (plastic) or clay liner but must maintain a minimum of 1×10^{-7} impermeability to contain the contaminated solids. It may also include a top soil layer and vegetation to prevent soil erosion and to protect the clay/HDP from freeze-thaw effects. The existing gravel lined ditch along the southern border of the capped portion of the landfill would be incorporated into the design of surface water run-off controls.

The use of a passive or active gas venting system would be determined during the remedial design phase of the project. Periodic inspections of the cover installed during the IRM will be performed before and during the implementation of the remedial action and damaged or degraded areas will be repaired. A surface and ground water monitoring (quarterly) and modeling program will be implemented to evaluate the impacts ground water or leachate is having on the Hackensack River and to evaluate the reduction, if any, of contaminant concentrations and determine if natural attenuation is occurring at the Site. If a significant adverse impact is found, NJDEP and EPA will evaluate and implement hydraulic controls to mitigate those impacts. The Site would be reviewed at the end of five years in order to reevaluate Site conditions. The review would include an analysis of the ground and surface water monitoring data, evaluate the impact ground water or leachate is having on the Hackensack River. The review will also include an assessment of current residual health risks, and an evaluation of the effectiveness of site fencing to control access.

ALTERNATIVE LF-5: NJDEP HAZARDOUS WASTE LANDFILL CAP

Estimated Capital Cost: $35,029,000
Annual Operation and Maintenance: $369,000
Estimated Present Worth: $36,714,000
Estimated Implementation Time: 3 years

As described earlier, a 45-acre portion of the landfill was already excavated and capped with one foot of clay and one foot of soil during the completion of the IRM. Under this alternative, the existing 45-acre IRM cap would be left in place and a new multi-layer cap would be placed over the entire 87-acre area. The new cap would comply with the New Jersey Hazardous Waste Regulation (N.J.A.C. 7:26-10.8(i)) regarding closure and post closure requirements for hazardous waste landfills. The proposed cap would consist of a vegetative top soil cover, a sand drainage layer, a bedding layer and a liner system constructed of two synthetic liners. The existing gravel-lined ditch would be incorporated in the design to facilitate the collection of surface water run-off.

In addition, institutional controls and Site fencing would be implemented as described for Alternative LF-2 above. Regular monitoring and a five year review would also be required as described for Alternative LF-4 above.

ALTERNATIVE LF-6: RCRA HAZARDOUS WASTE CAP - INCORPORATING IRM CAP

Estimated Capitol Cost: $44,226,000
Annual Operation and Maintenance: $369,000
Estimated Present Worth: $45,911,000
Estimated Implementation Time: 3 years

As described earlier, a 45-acre portion of the landfill was already excavated and capped with one foot of clay and one foot of soil during the completion of the IRM. Under this alternative, the existing IRM cap would be upgraded and incorporated into a Resource Conservation and Recovery Act (RCRA) cap, which would be installed over the remaining approximate 42-acre area. The RCRA cap is a multi-layer cap that combines several layers of cover materials such as soil, synthetic membranes, and clay to provide erosion and moisture control, in

addition to containing the contaminated solids. The entire Site would be graded for proper drainage and seeded with grass for erosion control. The existing gravel-lined ditch would be incorporated in the design to aide in the collection of surface water run-off.

This alternative includes institutional controls and site fencing as described in Alternative LF-2. Regular monitoring and a five year review would also be required as described for Alternative LF-4.

ALTERNATIVE LF-7: NEW RCRA HAZARDOUS WASTE CAP

Estimated Capital Cost: $47,879,00
Annual Operation and Maintenance: $369,000
Estimated Present Worth: $49,564,00
Estimated Implementation Time: 3 years

Under this Alternative, the existing IRM cap would be removed, graded, and used as the first layer of fill. A new RCRA cap would be placed over the entire 87 acre Site. As described in Alternative LF-6, the RCRA cap is a multi-layer cap that combines several layers of cover materials such as soil, synthetic membranes, and clay to provide erosion and moisture control, in addition to containing the contaminated solids. The entire Site would be graded for proper drainage and seeded with grass for erosion control. The existing gravel-lined ditch would be incorporated in the design to aide in the collection of surface water run-off.

This alternative includes institutional controls and Site fencing as described for Alternative LF-2. Regular monitoring and maintenance and a five year review would also be required as described for Alternative LF-4.

The following two options apply to alternative LF-3 to LF-7:

OPTION 1: NO DRUM REMOVAL

Estimated Capital Cost: NONE
Annual Operation and Maintenance: NONE
Estimated Present Worth: NONE
Estimated Implementation Time: NONE

Under this alternative, no excavation and removal of known buried drums and associated contaminants would be performed prior to capping.

OPTION 2: DRUM REMOVAL (EXCAVATION AND REMOVAL OF ALL KNOWN AND SUSPECTED BURIED DRUMS AND ASSOCIATED SOILS)

Estimated Capital Cost: $514,000*
Annual Operation and Maintenance: NONE
Estimated Present Worth: $515,000
Estimated Implementation Time: 6 months

* The figure is only a rough estimate: the actual cost will depend on the number of drums encountered.

The excavation and removal of all known and suspected buried drums and associated contaminated soils prior to capping is an additional, separate option that could be used in conjunction with any or all of the containment Alternatives LF-3 through LF-7. Under this option, excavation would be initiated at two (2) test pit (TP) cluster locations (see figures 3 and 4), which includes TP-10 through TP-17 and TP-19 until ground water is encountered, the fill area depth limit is reached, or until no more drums are found. All excavated drums and visually contaminated soils would be sampled and tested. Contaminated materials would be shipped off-site for proper disposal. The Site would be regraded after drums were removed prior to installation of the selected cap.

SUMMARY OF COMPARATIVE ANALYSIS OF ALTERNATIVES

In accordance with the NCP, a detailed analysis of each remedial alternative was conducted with respect to each of the nine criteria described below. This section discusses and compares the performance of the remedial alternatives considered against these criteria. All selected alternatives must at least attain the Threshold Criteria. The selected alternative should provide the best balance among the nine criteria. The Modifying Criteria were evaluated following the public comment period.

During the detailed evaluation of remedial alternatives, each alternative was assessed utilizing nine evaluation criteria as set forth in the NCP. These criteria were developed to address the requirements of Section 121 of CERCLA to ensure all important considerations are factored into remedy selection decisions.

Threshold Criteria

1. **Overall Protection of Human Health and the Environment** addresses whether or not an alternative provides adequate protection and describes how risks posed through each pathway are eliminated, reduced, or controlled through treatment, engineering controls, or institutional controls.

2. **Compliance with Applicable and Relevant and Appropriate Requirements (ARARs)** addresses whether or not an alternative will meet all of the ARARs of the Federal and State environmental statutes or provide a basis for invoking a waiver.

Primary Balancing Criteria

3. **Long-term Effectiveness and Permanence** refers to the magnitude of residual risk and the ability of an alternative to maintain reliable protection of human health and the environment over time once remedial objectives have been met.

4. **Reduction of Toxicity, Mobility, or Volume** addresses the statutory preference for selecting remedial actions that employ treatment technologies that permanently and significantly reduce toxicity,

mobility, or volume of the hazardous substances as a principal element.

5. Short-term Effectiveness refers to the period of time that is needed to achieve protection, as well as the alternative's potential to create adverse impacts on human health and the environment that may result during the construction and implementation period.

6. Implementability is the technical and administrative feasibility of a remedy, including the availability of materials and services needed to implement a particular alternative.

7. Cost includes estimated capital and operation and maintenance costs, and the present worth costs.

Modifying Criteria

8. Support Agency acceptance indicates whether, based on its review of the RI and FS reports and the ROD, the support agency opposes, and/or has identified any reservations with the preferred alternative.

9. Community acceptance refers to the public's general response to the alternatives described in the ROD and the RI/FS reports. Responses to public comments are addressed in the Responsiveness Summary of this Record of Decision.

A comparative analysis of these alternatives, based upon the evaluation criteria noted above, is presented below.

Overall Protection of Human Health and the Environment

Except for the No Action and Minimal Action alternatives, all of the containment alternatives, LF-3 through LF-7, would minimize the potential human and ecological risk. These alternatives would also minimize precipitation infiltration to the waste, thereby reducing the potential for contamination migration. The Sip Avenue ditch sediments would be isolated from future exposure potential.

However, capping would result in the loss or alteration of terrestrial and aquatic wildlife habitats in the PJP Landfill area. Some estuarine emergent wetlands would be capped as part of the proposed actions. Shallow water aquatic habitat in the Sip Avenue ditch would be lost as a result of the proposed filling. These actions generally could result in a loss of some wetland-associated species from the immediate Site area and in the loss of aquatic life from the ditch area. Terrestrial species adapted to grass/field environments are likely to inhabit the area once vegetation has been established on the cap. In order for the capping alternatives LF-3 through LF-7 to meet this criterion, wetlands mitigation activities (i.e. restoration, land banking) would have to be implemented at the Site.

Option 2: Removal of Drums, in conjunction with any of the capping alternatives, would provide protection of human health and the environment by reducing on-site contaminant concentrations and potential impacts to ground water quality.

Compliance with ARARs

Actions taken at any Superfund site must achieve ARARs of federal and state laws or provide grounds for waiving these requirements. The No Action, Minimal Action, and LF-3: Soil Cover alternatives do not comply with federal and state ARARs which regulate the closure and capping of either solid waste or hazardous waste landfills.

The No Action, Minimal Action, and capping alternatives do not address contamination in Sip Avenue Ditch sediments which are at levels in exceedance of the criteria set forth in NOAA sediment screening criteria. However, the capping alternatives all provide for replacement of the Sip Ave ditch with an alternative form of drainage, and would also provide protection from rainwater infiltration, thus reducing potential migration of subsurface contaminants into the ground water.

As part of the IRM in 1986 an estimated 10,000 drums (4,700 intact and 5,000 with contaminated soil) were disposed of off-site. ARAR compliance would be aided by Option 2 in conjunction with any of the capping alternatives.

Because No Action and Minimal Action alternatives do not meet both threshold requirements of overall protection of human health and the environment or compliance with ARARs, they will not be discussed further in the evaluation of alternatives.

Long-Term Effectiveness and Permanence

The capping alternatives would promote surface water run-off; cap implementability will offset the need for ground water collection and treatment. Ground water data has shown a significant reduction in contaminant concentration on the IRM capped portion of the landfill. This fact suggest that by implementing one of the capping alternatives the natural attenuation of ground water would be enhanced, while at the same time isolating the Sip Avenue Ditch sediments from future exposure potential. However, the capping alternatives do vary in permeability. The least permeable cap will provide the least migration of landfill contaminants off-site. Alternative LF-7, New RCRA Hazardous Waste Cap, has the least permeability while LF-3, Soil Cover, has the greatest.

Option 2 : Drum Removal in conjunction with a capping selection is the most effective in the long-term and the most permanent because the most concentrated areas of contamination would be permanently removed (in addition to the estimated 10,000 drums that were previously removed) from the Site and contaminated materials would then be shipped off-site for proper disposal.

Short-Term Effectiveness

In general, effective alternatives which can be implemented quickly with little risk to human health and the environment are favored under this criterion. The capping alternatives without the excavation option have high short-term effectiveness because they could be implemented relatively quickly (within three years) and would have relatively minor short-term risks to nearby workers, residents and commuters.

Construction of any of the capping alternatives would involve some excavation and handling of contaminated soils during the initial Site regrading, but exposure could be reduced through the use of suitable protective clothing and equipment. Exposure of the surrounding community through fugitive dust emissions could be easily controlled using good construction practices and air monitoring. Short-term risks to the community, workers, or the environment are expected to be minor.

However, Option 2 Drum Removal provides potentially increased hazardous conditions for the workers, community, commuters on the Pulaski Skyway, and the environment. However, this short term risk can be mitigated with proper health and safety, community awareness and air monitoring. Potential risks associated with the drum removal will be addressed during the design phase of the project via a site specific health and safety plan and an emergency response plan.

Reduction of Toxicity, Mobility or Volume

The capping alternatives without the excavation option would reduce mobility by preventing the migration of contaminants into the air and off-site run-off via erosion. The cap would also reduce leaching of contaminants into ground water. However, these alternatives alone would not reduce toxicity or volume of the contaminants.

Option 2 Drum Removal, which consists of the excavation and removal of all known and suspected buried drums and associated soils would reduce the toxicity, mobility and volume of the contaminated material in the site itself. Option 2 would result in the reduction of the volume of contaminants. In addition, the capping alternative would further reduce the mobility of any contaminants remaining on Site after excavation.

Implementation

All of the alternatives are fairly easily implementable from an engineering standpoint. The capping alternatives without the excavation option are easy to implement with the technology, equipment and resources being established and readily available. The RCRA Hazardous Waste Cap alternatives would take longer than the Solid Waste Cap alternative due to the multiple layer construction.

Option 2 Drum Removal is feasible, however, the implementation would present some difficulty due to the potential health and safety hazards. Again, these concerns

can be mitigated. This option would also add to the length of time required to implement the remedy.

Cost

The capping alternatives are all the same order of magnitude, with the least expensive being the Solid Waste Cap and the most expensive being the New RCRA and NJDEP Hazardous Waste Caps.

Option 2: Drum Removal increases the cost of each of the capping alternatives. Although subsurface contamination is not a current risk pathway, the excavation and removal option affords a degree of long-term effectiveness and permanence by excavation, removal and off-site treatment of buried drums and associated highly contaminated visibly stained soil. In addition, this option would minimize any future ground water contamination which may occur as the result of wastes contained in these known areas. Therefore, the cost of the value added from the reduction of subsurface contaminants may be warranted by reducing and possibly eliminating the need for long term ground water treatment.

Support Agency Acceptance

The United States Environmental Protection Agency supports the selected remedy presented in this Record of Decision.

Community Acceptance

Community acceptance was evaluated after the close of the public comment period. Written comments received during the public comment period, as well as verbal comments during the public meeting on August 18, 1994, were evaluated.

The majority of comments received during the public comment period originated from the potentially responsible parties (PRPs). Their comments focused on the definition of landfill boundaries, the appropriateness of the preferred cap with respect to scope and effectiveness, as well as future use. Concerns were also raised during the public meeting regarding how reasonable risk is determined and the impact this remediation may have on currently operating facilities in the vicinity of the landfill. The PRPs were concerned that a portion of the landfill area (as it was depicted in the FS drawings) was not a part of the PJP landfill site.

The responses to these and other comments are addressed in the Responsiveness Summary. Comments received during the public comment period indicated that the local residents were mostly satisfied with the preferred alternatives for the soil and ground water.

SELECTED REMEDY

NJDEP and EPA have determined after reviewing the alternatives and public comments, that Alternative LF-4 with Option 2 is the appropriate remedy for the Site, Because it best satisfies the requirements of CERCLA §121, 42 U.S.C.§9621, and the NCP's nine evaluation criteria for remedial alternatives, 40 CFR §300.430(e)(9).

Alternative LF-4: Modified NJDEP Solid Waste Cap (extending existing cap): $22,022,000, replacement of the Sip Ave ditch with an alternate form of drainage, and Option 2: Drum Removal (Excavation and Removal of All Known and Suspected Buried Drums and associated contaminated soil): $514,000, is the most appropriate remedy for the PJP Landfill Site.

The major components of the selected remedy include the following:

- Removal of all known and suspected buried drums and associated visibly contaminated soil;
- Capping the remaining landfill area of Site with a multi-layer, modified solid waste type cap;
- Extending the existing gravel lined ditch around the perimeter of the Site to collect the surface water runoff;
- A passive gas or active venting system installed in the new portion of the cap. However, if an active system is deemed necessary, both areas will be included;
- Site fencing and institutional controls (e.g., deed restrictions and public information program);
- Periodic inspections of the cover installed during the IRM must be performed before and during the implementation of the remedial action. If the cover is damaged or degraded, then at least 1 additional foot of topsoil should be spread over the previously installed cover.
- Replacing the Sip Ave ditch with an alternate form of drainage;
- Quarterly ground water and surface water monitoring to evaluate the reduction of contaminant concentrations over time; if a significant adverse impact is found, NJDEP and EPA will evaluate remedial alternatives and select an appropriate remedy in accordance with CERCLA and the NCP.
- Because contamination levels in the ground water are above the Class IIA GWQC, a CEA/WRA will be established;
- Implementation of a wetlands assessment and restoration plan. The wetlands assessment will be performed before any of the remedial actions are begun.

The multi-layer cap would comply with NJDEP sanitary landfill closure requirements. Since removal of all known and suspected buried drum material and associated visibly contaminated soils would remove the significant hazardous waste known to be deposited in the landfill, closure utilizing a RCRA hazardous waste cap is not necessary. Based on the results of the baseline risk assessment the Site does not currently present an immediate risk to human health and the environment via the groundwater or surface water exposure pathways. Therefore, NJDEP and EPA determined it was appropriate to monitor and evaluate groundwater and surface water for a 5 year period, and then assess what additional measures, if any, should be implemented. The use of a passive or active gas venting system would be determined during the remedial design phase of the project.

The capped area would require quarterly inspections and replacements, as necessary, of grass, seed and topsoil. Ground water and surface water monitoring will be performed quarterly to evaluate the reduction of contaminant concentrations and to determine if natural attenuation is occurring at the Site. The Site would be reviewed for five years in order to evaluate effectiveness of

the remedy. The review will also include an assessment of current residual health risks, an evaluation of the effectiveness of the Site fencing to control access, and an evaluation of what additional remedial measures, if any, should be implemented based on the reviewed Site conditions.

The selected alternative provides the best balance among alternatives with respect to the evaluation criteria. NJDEP and EPA believe that the selected alternative would be protective of human health and the environment, would comply with the Remedial Action Objectives, would be cost-effective, and would utilize permanent solutions and alternative treatment technologies or resource recovery technologies to the maximum extent practicable.

The excavation and removal of drums and surrounding highly contaminated soil is protective of human health and the environment. The selected alternative has a favorable short-term effectiveness because it could be implemented relatively quickly. The selected alternative also, provides for long-term effectiveness and permanence by removing and treating the highly contaminated materials from disposal areas. The long-term effectiveness and permanence of the alternative outweigh short-term risks associated with excavation.

Remedial Investigation and subsequent sampling results indicate that contaminants' concentrations in the shallow aquifer are reducing over time. Ground water contamination in the deep aquifer is at concentrations below any level of concern at the present time.

Implementation of the selected alternative (i.e., capping and drum removal) will reduce the leaching of contaminants into ground water. The five year ground water and surface water monitoring program and the model will enable NJDEP and EPA to reevaluate Site conditions and determine the effectiveness of the remedy selected. If a significant adverse impact is found, NJDEP and EPA will evaluate remedial alternatives and select an appropriate remedy in accordance with CERCLA and the NCP.

The preferred alternative provides protection to human health by preventing direct contact with the contaminated material, and by preventing the migration of contaminants by reducing infiltration and erosion. Moreover, the combination of this alternative and the excavation and removal of drums and surrounding contaminated soil option, would satisfy the statutory preference for remedies which utilize treatment as a principal element.

NJDEP realizes the inherent short-term risks associated with excavation and removal of contaminated drums and surrounding soil. For this reason, NJDEP would implement a comprehensive Site Health and Safety Plan to mitigate the short-term risks to nearby workers, residents, and commuters.

Maintaining the level of risk reduction afforded by the proposed remedy depends on preserving the long-term integrity of the cap and enforcement of institutional controls. Institutional controls would include use restrictions to restrict future use of the Site and public information programs to increase the public awareness of potential problems associated with the Site. The NJDEP Solid Waste Cap has proven to be a very effective and reliable remedial technology. Implementing the NJDEP Solid Waste Cap also presents few short-term risks. In

addition, the NJDEP Solid Waste Cap with the incorporation of the existing IRM cap provides the maximum protection to human health and the environment at a reasonable cost.

STATUTORY DETERMINATIONS

Under its legal authorities, EPA's primary responsibility at Superfund sites is to undertake remedial actions that are protective of human health and the environment. In addition, Section 121 of CERCLA establishes several other statutory requirements and preferences. These specify that when complete, the selected remedial action for the PJP Landfill Site must comply with applicable, or relevant and appropriate environmental standards established under federal and state environmental laws unless a statutory waiver is justified. The selected remedy also must be cost effective and utilize permanent solutions and alternative treatment technologies or resource-recovery technologies to the maximum extent practicable. Finally, the statute includes a preference for remedies that employ treatment that permanently and significantly reduce the volume, toxicity, or mobility of hazardous wastes. The following sections discuss how the selected remedy meets these statutory requirements.

Protection of Human Health and the Environment

The selected remedy is protective of human health and the environment, as it effectively addresses the principal threats posed by the Site, namely:
Chemical-specific ARARs:

- Safe Drinking Water Act (SDWA) Maximum Contaminant Levels (MCLs):
  (40 CFR Part 141)
- Clean Water Act Water Quality Criteria (WQC):
  (40 CFR Part 131)
- RCRA Maximum Concentration Limits (MCLs):
  (40 CFR 264)
- RCRA Land Disposal Restrictions:
  (40 CFR 268)
- New Jersey Safe Drinking Water Act MCLs:
  (NJAC: 7:10-16)
- New Jersey Water Pollution Control Act Standards for Groundwater:
  (NJAC: 7:9-6)
- New Jersey Water Pollution Discharge Elimination System:
  (NJAC: 7:14A)

- New Jersey Surface Water Quality Standards:
  (NJAC 7:9-4.1)

Location-specific ARARs:

- Clean Water Act, Section 404:
  (33 USC 466)
- Executive Orders on Floodplain Management and Protection of Wetlands:
  (E.O. 11988, 11990)
- EPA/COE Memorandum of Agreement on Wetlands Protection
- Fish and Wildlife Coordination Act:
  (16 USC 661)
- Endangered Species Act:
  (16 USC 1531)
- National Historic Preservation Act:
  (16 USC 470)
- New Jersey Flood Hazard Area Control Act:
  (NJSA 58:6A-50)
- New Jersey Freshwater Wetlands Protection Act:
  (NJSA 13:9B-1)
- New Jersey Freshwater Wetlands Transition Area Rules:
  (NJAC 7:7)
- New Jersey Freshwater Wetlands Protection Rules:
  (NJAC 7:7A)
- New Jersey Stream Encroachment Regulations:
  (NJAC 7:13-1.1)

Action-specific ARARs:

- Clean Water Act Water Quality Criteria (WQC):
  (40 CFR Part 131)
- RCRA Land Disposal Restrictions:
  (40 CFR 268)
- Clean Air Act National Ambient Air Quality Standards:
  (40 CFR Part 50)
- OSHA General Industry Standards:
  (29 CFR 1910)

- OSHA Safety and Health Standards:
  (29 CFR 1926)

- OSHA Record Keeping, Reporting, and Related Regulations:
  (29 CFR 1904)

- RCRA Standards for Generators of Hazardous Waste:
  (40 CFR 262.1)

- RCRA Standards for Transporters of Hazardous Waste:
  (40 CFR 263.11, 263.20-21, and 263.30-31)

- RCRA Standards for Owners/Operators of Permitted Hazardous Waste Facilities:
  (40 CFR 264.10-264.18)

- RCRA - Preparedness and Prevention:
  (40 CFR 264.30-31)

- RCRA - Contingency Plan and Emergency Procedures:
  (40 CFR 264.50-264.56)

- RCRA - Groundwater Protection:
  (40 CFR 264.90-264.109)

- RCRA - Standards for Excavation and Fugitive Dust:
  (40 CFR 264.251-264.254)

- RCRA - Miscellaneous Units:
  (40 CFR 264.600-264.999)

- RCRA - Closure and Post-Closure
  (40 CFR 264.110-264.120)

- DOT Rules for Transportation of Hazardous Materials:
  (49 CFR 107, 171.1-172.558)

- New Jersey Hazardous Waste Manifest System Rules:
  (NJAC 7:26)

- New Jersey Hazardous Waste Treatment Storage and Disposal Facility Permitting Requirements:
  (NJAC 7:26)

- New Jersey Water Pollution Discharge Elimination System:
  (NJAC: 7:14A)

- New Jersey Surface Water Quality Standards:
  (NJAC 7:9-4.1)

- New Jersey Clean Air Act:
  (NJSA 26:2C)

- New Jersey Air Pollution Control Act:
  (NJAC 7:27-5, 13, 16, and 17)

Cost-Effectiveness

Of the alternatives which most effectively address the threats posed by Site contamination, the selected remedy provides for overall effectiveness in proportion to its cost. The estimated total project cost, including both the selected capping alternative and drum removal, is $22,536,000.

Utilization of Permanent Solutions and Alternative Treatment Technologies to the Maximum Extent Practicable

Capping the Site would provide protection from rainwater infiltration, thus reducing potential migration of subsurface contaminants into ground water. This will significantly reduce the toxicity, mobility and volume of the contaminants, and offer a permanent solution to the risks posed by surface soils.

Preference for Treatment as a Principal Element

In keeping with the statutory preference for treatment as a principal element of the remedy, the remedy provides for the excavation and removal of known buried drums and associated contaminants, which, would be shipped off-site for disposal, possibly by incineration.

The treatment of landfill material, however, is not practicable, because of the size of the landfill and because the identified on-site hot spots that represented the major sources of contamination were removed during the IRM.

DOCUMENTATION OF SIGNIFICANT CHANGES

The Proposed Plan for the Site was released to the public on August 2, 1995. The Proposed Plan identified the preferred alternatives for groundwater and soil remediation. EPA reviewed all written and verbal comments received during the public comment period. Upon review of these comments, DEP determined that no significant changes to the selected remedy, as it was originally identified in the Proposed Plan, were necessary.

APPENDIX I

FIGURES

Figure #	Identification
1	General Location Map
2	PJP Site Map
3	Testpit (TP #10 - #17) Location
4	Testpit (TP #19) Location

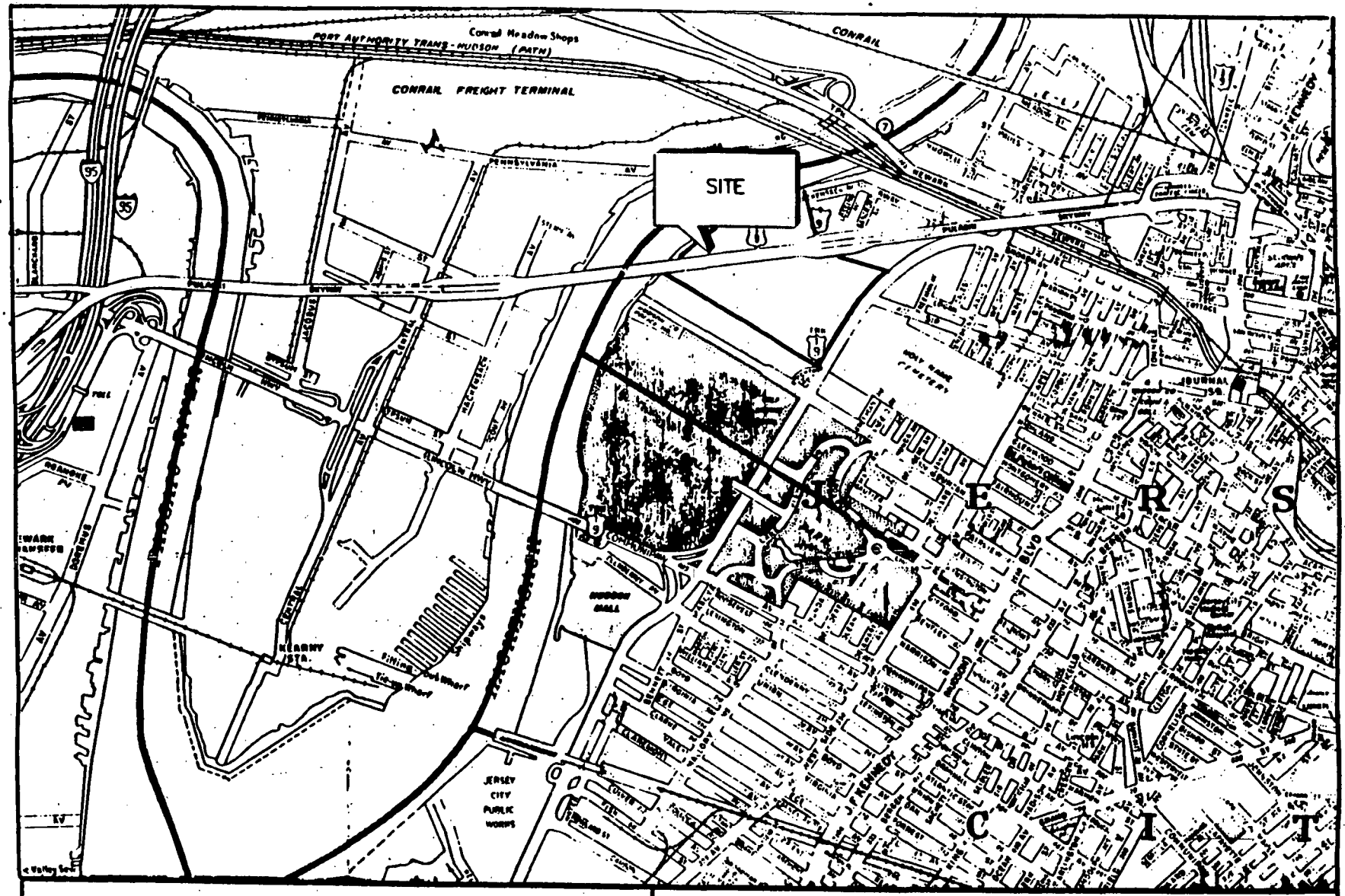


Figure 1
Site Location Map

PJP LANDFILL, JERSEY CITY, NEW JERSEY
ICF TECHNOLOGY, INC

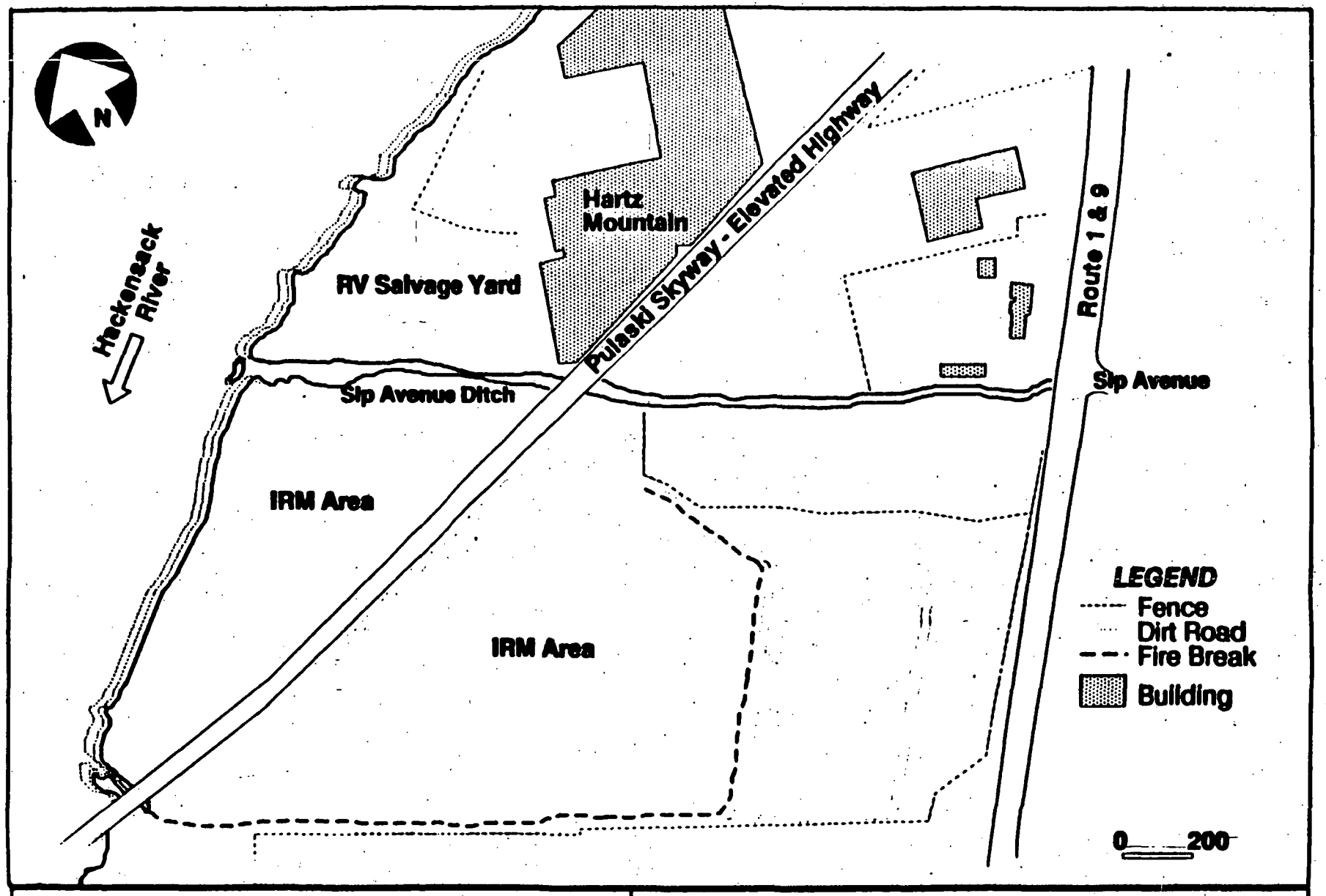


Figure
Site Map

PJP LANDFILL, JERSEY CITY, NEW JERSEY

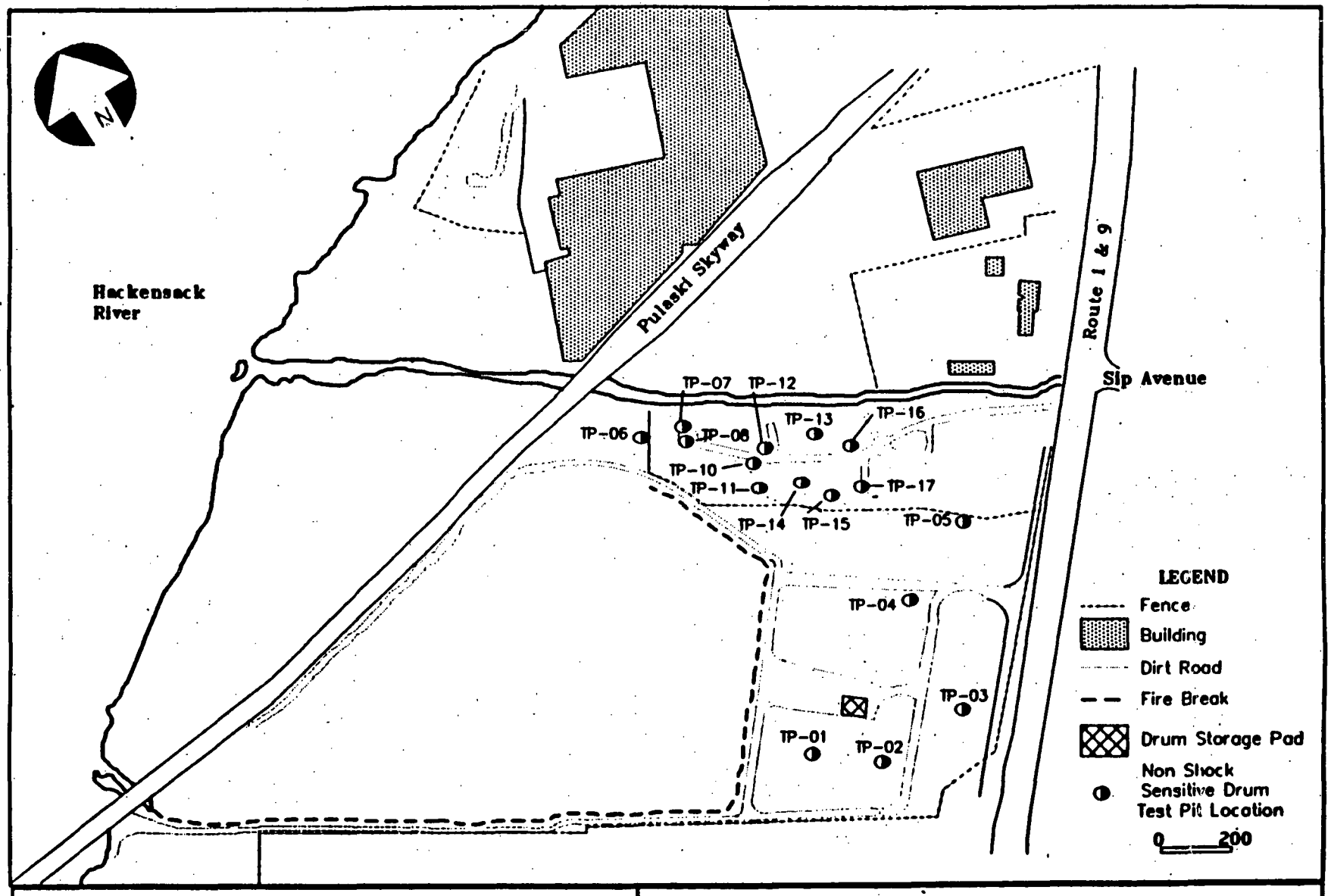


FIGURE 3
Non Shock Sensitive Test Pit Locations

PJP LANDFILL, JERSEY CITY, NEW JERSEY
ICF TECHNOLOGY, INC

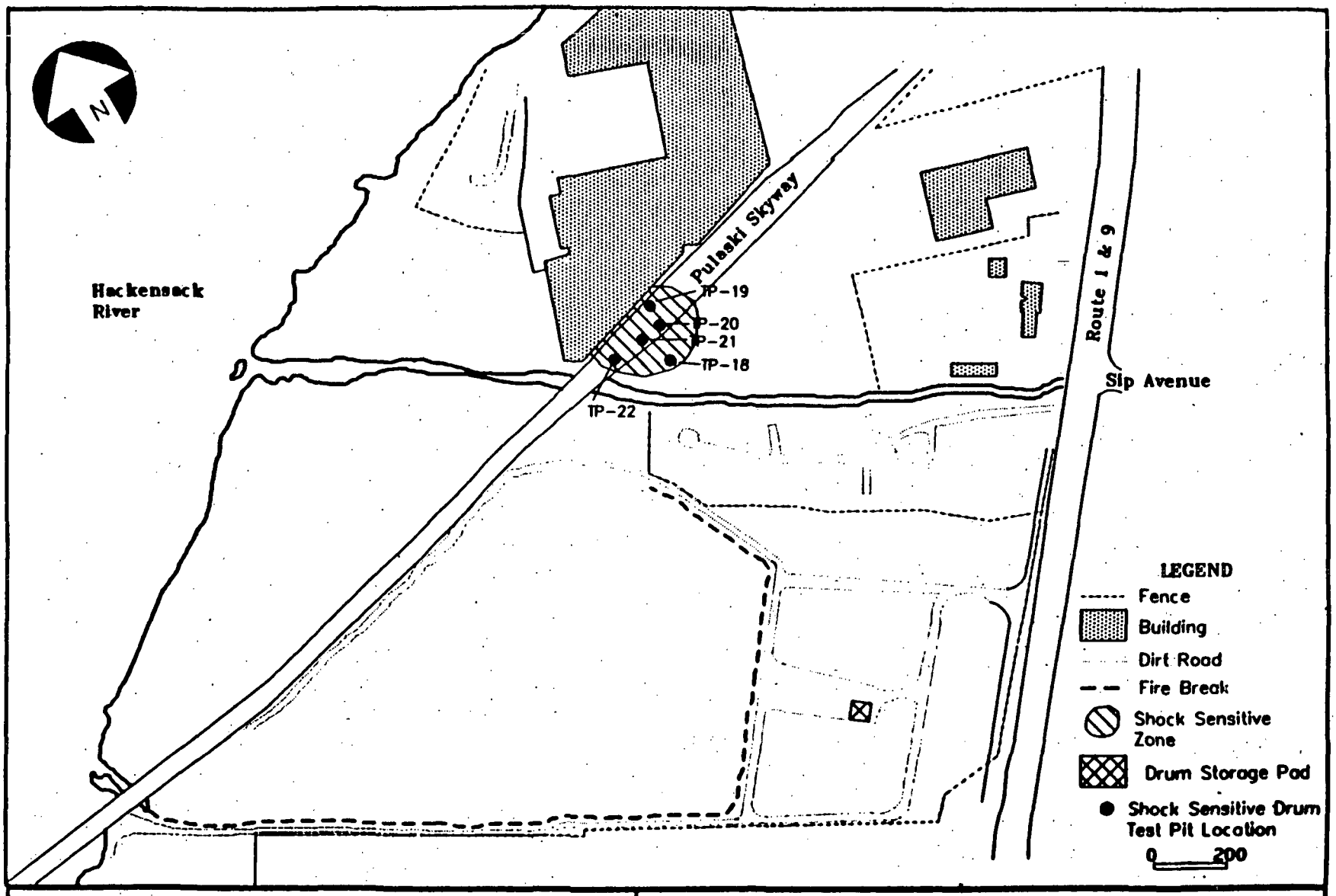


FIGURE 4
Shock Sensitive Test Pit Locations

PJP LANDFILL, JERSEY CITY, NEW JERSEY
ICF TECHNOLOGY, INC

APPENDIX II

TABLES

5-39 Potential Exposures And Risks Associated With Ingestion Of Chemicals In Groundwater (Hypothetical Future Land Use)

Table 5-15
SUMMARY OF CHEMICALS OF POTENTIAL CONCERN AT THE PJP LANDFILL SITE

Chemical	Surface Soil	Subsurface Soil	Test Pits	Groundwater	Surface Water			Sediment			Air
					Ditch	River Above Ditch	West of Landfill	Ditch	River Above Ditch	West of Landfill	
Organic:											
Acetone						X					
Aldrin			X								
alpha-BHC		X	X								
Benzene		X	X	X	X	X		X	X	X	X
Benzyl alcohol				X	X						
Bis(2-chloroethyl)ether		X	X	X	X						
Bis(2-chloroisopropyl)ether				X	X						
Bis(2-ethylhexyl)phthalate	X	X	X		X			X	X	X	
2-Butanone										X	
Carbon tetrachloride			X								
Chlordane	X				X						
Chlorobenzene											X
Chloroethane				X							
Chloroform	X		X	X	X			X	X		X
DDT		X	X								
Di-n-butylphthalate							X			X	
Di-n-octylphthalate	X	X	X	X				X		X	
1,4-Dichlorobenzene		X	X								
3,3'-Dichlorobenzidine		X									
1,1-Dichloroethane			X								X
1,2-Dichloroethane	X		X								
1,1-Dichloroethene			X								
trans-1,3-Dichloropropene		X									
Dieldrin			X								
2,4-Dimethylphenol		X		X							
Dimethylphthalate	X										
Dioxin			X								
Endosulfan sulfate	X	X	X					X			
Endrin	X										
Ethylbenzene					X					X	
Heptachlor			X								
Heptachlor epoxide		X									
2-Hexanone		X	X								
Methylene chloride		X	X	X				X			X
3-Nitroaniline		X									
4-Nitroaniline		X									
n-Nitrosodiphenylamine			X		X			X	X		
n-Nitroso-dipropylamine									X		
PAH--cPAH	X	X	X					X	X	X	
PAH--ncPAH										X	
PCBs			X								
Petroleum hydrocarbons	X	X	X	X	X			X	X	X	
Phenols (total)				X	X						
Tetrachloroethene	X		X					X			X
Toluene											X
1,1,1-Trichloroethane										X	X
Trichloroethene	X		X								
Vinyl acetate				X							
Vinyl chloride			X								X
Xylenes											X

Table 5-15 (Continued)

SUMMARY OF CHEMICALS OF POTENTIAL CONCERN AT THE PJP LANDFILL SITE

Chemical	Surface Soil	Subsurface Soil	Test Pits	Groundwater	Surface Water			Sediment		
					Ditch	River Above Ditch	West of Landfill	Ditch	River Above Ditch	West of Landfill
Inorganic:										
Aluminum			X	X	X	X	X			
Antimony	X	X	X	X				X	X	
Arsenic	X	X	X	X	X			X	X	
Barium		X		X	X	X	X	X	X	
Beryllium			X			X		X		
Cadmium	X			X					X	
Calcium	X	X	X		X	X	X	X	X	
Chloride				X	X	X				
Chromium			X	X	X	X	X			
Cobalt			X		X			X		
Copper			X	X		X	X	X		
Iron		X	X	X	X	X	X	X		
Lead		X	X	X	X				X	
Magnesium		X	X		X	X	X	X	X	
Manganese				X	X	X	X			
Mercury	X	X		X	X	X	X	X	X	X
Nickel				X	X			X		
Potassium				X	X	X	X			
Selenium										X
Sodium				X	X	X	X	X	X	
Sulfate				X	X	X				
Thallium				X						
Vanadium					X					
Zinc				X	X	X	X	X		

TABLE 5-17

SUMMARY OF EXPOSURE PATHWAYS TO BE EVALUATED FOR THE PJP LANDFILL SITE

Potentially Exposed Population	Exposure Pathway
Current Land Use:	
Trespassing children playing on the landfill remediation/ staging area	Dermal absorption and incidental ingestion of surface soil
	Inhalation of chemicals released from landfill vents
Trespassing children wading in the Sip Avenue Ditch	Dermal absorption of chemicals in Sip Avenue Ditch sediment and surface water, and incidental ingestion of chemicals in sediment
Trespassing children swimming in the Hackensack River near the site	Dermal absorption and incidental ingestion of chemicals in Hackensack River surface water and sediment
Workers	Inhalation of chemicals released from landfill vents and dispersed offsite to adjacent businesses
Residents	Inhalation of chemicals released from landfill vents and dispersed offsite to nearby apartment buildings
Hypothetical Future Use:	
Residents	Ingestion of groundwater from the shallow and deep aquifers (combined)
Workers	Dermal absorption and incidental ingestion of surface and subsurface soil and test pit material. (Qualitative evaluation only.)
	Inhalation of chemicals released from landfill vents. (Qualitative evaluation only.)

TABLE 5-24

POTENTIAL EXPOSURES AND RISKS ASSOCIATED WITH INCIDENTAL INGESTION AND DERMAL ABSORPTION OF CHEMICALS IN SURFACE SOILS BY CHILDREN TRESPASSING ON THE LANDFILL (CURRENT LAND USE)

POTENTIAL CARCINOGENS

Chemical	Soil Concentration (a) (mg/kg)		Quantity of Chemical Ingested and Absorbed (b) (mg/kg-day)		Quantity of Chemical Absorbed Dermally (c) (mg/kg-day)		Combined Chronic Daily Intake (CDI) (d) (mg/kg-day)		Potency Factor (e) (mg/kg-day)-1	Lifetime Upper Bound Excess Cancer Risk (f)	
	Geometric Mean	Maximum	Average Case	Plausible Maximum Case	Average Case	Plausible Maximum Case	Average Case	Plausible Maximum Case		Average Case	Plausible Maximum Case
Arsenic	1.00E+01	2.91E+01	3.64E-07	5.29E-06	1.09E-08	3.09E-06	3.75E-07	8.39E-06	2.0E+00	7E-07	2E-05
Bis(2-ethylhexyl)phthalate	1.70E+01	1.40E+02	9.27E-08	1.27E-05	5.56E-09	1.49E-05	9.83E-08	2.76E-05	1.4E-02	1E-09	4E-07
Chlordane	4.77E-02	5.65E-02	2.60E-10	5.14E-09	5.20E-11	4.01E-09	3.12E-10	9.14E-09	1.3E+00	4E-10	1E-08
Chloroform	7.70E-03	7.10E-02	2.80E-10	1.29E-08	2.10E-10	6.29E-08	4.90E-10	7.58E-08	6.1E-03	3E-12	5E-10
1,2-Dichloroethane	5.20E-03	1.90E-02	1.89E-10	3.45E-09	1.42E-10	1.68E-08	3.31E-10	2.03E-08	9.1E-02	3E-11	2E-09
PAH--cPAH	1.00E+00	2.40E+00	5.45E-09	2.18E-07	9.82E-10	1.70E-07	6.44E-09	3.88E-07	1.2E+01	7E-08	4E-06
Tetrachloroethene	1.05E-02	1.50E-01	3.82E-10	2.73E-08	2.86E-10	1.33E-07	6.68E-10	1.60E-07	5.1E-02	3E-11	8E-09
Trichloroethene	7.40E-03	6.70E-02	2.69E-10	1.22E-08	2.02E-10	5.94E-08	4.71E-10	7.16E-08	1.1E-02	5E-12	8E-10
TOTAL	---	---	---	---	---	---	---	---	---	8E-07	2E-05

NONCARCINOGENS

Chemical	Soil Concentration (a) (mg/kg)		Quantity of Chemical Ingested and Absorbed (b) (mg/kg-day)		Quantity of Chemical Absorbed Dermally (c) (mg/kg-day)		Combined Chronic Daily Intake (CDI) (d) (mg/kg-day)		Reference Dose (RfD) (e) (mg/kg-day)	Ratio CDI:RfD (g)	
	Geometric Mean	Maximum	Average Case	Plausible Maximum Case	Average Case	Plausible Maximum Case	Average Case	Plausible Maximum Case		Average Case	Plausible Maximum Case
Antimony	2.07E+01	3.93E+01	8.78E-06	8.34E-05	2.63E-07	4.88E-05	9.04E-06	1.32E-04	4.0E-04	2E-02	3E-01
Arsenic	1.00E+01	2.91E+01	4.24E-06	6.17E-05	1.27E-07	3.61E-05	4.37E-06	9.78E-05	1.0E-03	4E-03	1E-01
Bis(2-ethylhexyl)phthalate	1.70E+01	1.40E+02	1.08E-06	1.48E-04	6.49E-08	1.74E-04	1.15E-06	3.22E-04	2.0E-02	6E-05	2E-02
Cadmium	5.60E+00	2.81E+01	2.38E-06	5.96E-05	7.13E-08	3.49E-05	2.45E-06	9.45E-05	1.0E-03	2E-03	9E-02
Chlordane	4.77E-02	5.65E-02	3.04E-09	5.99E-08	6.07E-10	4.67E-08	3.64E-09	1.07E-07	6.0E-05	6E-05	2E-03
Chloroform	7.70E-03	7.10E-02	3.27E-09	1.51E-07	2.45E-09	7.34E-07	5.72E-09	8.85E-07	1.0E-02	6E-07	9E-05
Endrin	1.16E-01	7.50E-01	7.38E-09	7.95E-07	1.48E-09	6.20E-07	8.86E-09	1.42E-06	3.0E-04	3E+05	5E-03
Mercury	6.00E-01	1.70E+00	2.55E-07	3.61E-06	7.64E-09	2.11E-06	2.62E-07	5.72E-06	3.0E-04	9E-04	2E-02
Tetrachloroethene	1.05E-02	1.50E-01	4.45E-09	3.18E-07	3.34E-09	1.55E-06	7.79E-09	1.87E-06	1.0E-02	8E-07	2E-04
Trichloroethene	7.40E-03	6.70E-02	3.14E-09	1.42E-07	2.35E-09	6.93E-07	5.49E-09	8.35E-07	7.3E-03	7E-07	1E-04
HAZARD INDEX	---	---	---	---	---	---	---	---	---	<1 (3E-2)	<1 (8E-1)

(a) Concentrations as reported in Table 5-2.
(b) See text for methodology. Calculated using equation 1 and assumptions presented in Table 5-23.
(c) See text for methodology. Calculated using equation 2 and assumptions presented in Table 5-23.
(d) Sum of ingestion and dermal intakes.
(e) Reported previously in Table 5-19.
(f) Calculated by multiplying the CDI by the potency factor.
(g) Calculated by dividing the CDI by the RfD.

TABLE 5-25

POTENTIAL EXPOSURES AND RISKS ASSOCIATED WITH INCIDENTAL INGESTION AND DERMAL ABSORPTION BY CHILDREN OF CHEMICALS IN SEDIMENT FROM THE SIP AVENUE DITCH (CURRENT LAND USE)

POTENTIAL CARCINOGENS

Chemical	Sediment Concentration (a) (mg/kg)		Quantity of Chemical Ingested and Absorbed (b) (mg/kg-day)		Quantity of Chemical Absorbed Dermally (c) (mg/kg-day)		Combined Chronic Daily Intake (CDI) (d) (mg/kg-day)		Potency Factor (e) (mg/kg-day)-1	Lifetime Upper Bound Excess Cancer Risk (f)	
	Geometric Mean	Maximum	Average Case	Plausible Maximum Case	Average Case	Plausible Maximum Case	Average Case	Plausible Maximum Case		Average Case	Plausible Maximum Case
Arsenic	8.70E+00	2.01E+01	3.16E-07	3.05E-06	1.03E-08	2.33E-06	3.27E-07	5.37E-06	2.0E+00	7E-07	1E-05
Benzene	1.94E-01	5.82E-01	7.05E-09	8.82E-08	5.73E-09	5.62E-07	1.28E-08	6.50E-07	2.9E-02	4E-10	2E-08
Bis(2-ethylhexyl)phthalate	1.64E+01	5.90E+01	8.94E-08	4.47E-06	5.81E-09	6.84E-06	9.53E-08	1.13E-05	1.4E-02	1E-09	2E-07
Chloroform	3.81E-01	1.64E+00	1.39E-08	2.48E-07	1.13E-08	1.58E-06	2.51E-08	1.83E-06	6.1E-03	2E-10	1E-08
Methylene chloride	1.79E+01	2.30E+01	6.51E-07	3.48E-06	5.29E-07	2.22E-05	1.18E-06	2.57E-05	7.5E-03	9E-09	2E-07
n-Nitrosodiphenylamine	3.30E-01	3.30E-01	1.20E-08	5.00E-08	9.75E-09	3.19E-07	2.17E-08	3.69E-07	4.9E-03	1E-10	2E-09
PAH--cPAH	4.77E+00	1.48E+01	2.60E-08	1.12E-06	5.07E-09	1.14E-06	3.11E-08	2.26E-06	1.2E+01	4E-07	3E-05
Tetrachloroethene	2.79E-01	1.00E+00	1.01E-08	1.52E-07	8.24E-09	9.66E-07	1.84E-08	1.12E-06	5.1E-02	9E-10	6E-08
TOTAL	---	---	---	---	---	---	---	---	---	1E-06	4E-05

NONCARCINOGENS

Chemical	Sediment Concentration (a) (mg/kg)		Quantity of Chemical Ingested and Absorbed (b) (mg/kg-day)		Quantity of Chemical Absorbed Dermally (c) (mg/kg-day)		Combined Chronic Daily Intake (CDI) (d) (mg/kg-day)		Reference Dose (RfD) (e) (mg/kg-day)	Ratio CDI:RfD (g)	
	Geometric Mean	Maximum	Average Case	Plausible Maximum Case	Average Case	Plausible Maximum Case	Average Case	Plausible Maximum Case		Average Case	Plausible Maximum Case
Antimony	3.07E+01	9.38E+01	1.30E-05	1.66E-04	4.23E-07	1.27E-04	1.34E-05	2.93E-04	4.0E-04	3E-02	7E-01
Arsenic	8.70E+00	2.01E+01	3.69E-06	3.55E-05	1.20E-07	2.72E-05	3.81E-06	6.27E-05	1.0E-03	4E-03	6E-02
Barium	2.06E+02	6.83E+02	8.74E-05	1.21E-03	2.84E-06	9.24E-04	9.02E-05	2.13E-03	5.0E-02	2E-03	4E-02
Beryllium	3.30E+00	2.58E+01	1.40E-06	4.56E-05	4.55E-08	3.49E-05	1.45E-06	8.05E-05	5.0E-03	3E-04	2E-02
Bis(2-ethylhexyl)phthalate	1.64E+01	5.90E+01	1.04E-06	5.21E-05	6.78E-08	7.98E-05	1.11E-06	1.32E-04	2.0E-02	6E-05	7E-03
Chloroform	3.81E-01	1.64E+00	1.62E-07	2.90E-06	1.31E-07	1.85E-05	2.93E-07	2.14E-05	1.0E-02	3E-05	2E-03
Copper	7.52E+02	3.40E+04	3.19E-04	6.01E-02	1.04E-05	4.60E-02	3.29E-04	1.06E-01	3.7E-02	9E-03	3E+00
Mercury	9.00E-01	5.10E+00	3.82E-07	9.01E-06	1.24E-08	6.90E-06	3.94E-07	1.59E-05	3.0E-04	1E-03	5E-02
Methylene chloride	1.79E+01	2.30E+01	7.59E-06	4.07E-05	6.17E-08	2.59E-04	1.38E-05	3.00E-04	6.0E-02	2E-04	5E-03
Nickel	5.64E+01	1.26E+03	2.39E-05	2.23E-03	7.78E-07	1.70E-03	2.47E-05	3.93E-03	2.0E-02	1E-03	2E-01
Tetrachloroethene	2.79E-01	1.00E+00	1.18E-07	1.77E-06	9.62E-08	1.13E-05	2.15E-07	1.30E-05	1.0E-02	2E-05	1E-03
Zinc	7.72E+02	9.83E+03	3.27E-04	1.74E-02	1.06E-05	1.33E-02	3.38E-04	3.07E-02	2.0E-01	2E-03	2E-01
HAZARD INDEX	---	---	---	---	---	---	---	---	---	<1 (5E-2)	>1 (4)

(a) Concentrations as reported in Table 5-11.
(b) See text for methodology. Calculated using equation 1 and assumptions presented in Table 5-23 and in the text.
(c) See text for methodology. Calculated using equation 2 and assumptions presented in Table 5-23 and in the text.
(d) Sum of ingestion and dermal intakes.
(e) Reported previously in Table 5-19.
(f) Calculated by multiplying the CDI by the potency factor.
(g) Calculated by dividing the CDI by the RfD.

TABLE 5-26

POTENTIAL EXPOSURES AND RISKS ASSOCIATED WITH INCIDENTAL INGESTION AND DERMAL ABSORPTION BY CHILDREN OF CHEMICALS IN SEDIMENT FROM THE HACKENSACK RIVER ABOVE THE SIP AVENUE DITCH (CURRENT LAND USE)

POTENTIAL CARCINOGENS

Chemical	Sediment Concentration (a) (mg/kg)		Quantity of Chemical Ingested and Absorbed (b) (mg/kg-day)		Quantity of Chemical Absorbed Dermally (c) (mg/kg-day)		Combined Chronic Daily Intake (CDI) (d) (mg/kg-day)		Potency Factor (e) (mg/kg-day)-1	Lifetime Upper Bound Excess Cancer Risk (f)	
	Geometric Mean	Maximum	Average Case	Plausible Maximum Case	Average Case	Plausible Maximum Case	Average Case	Plausible Maximum Case		Average Case	Plausible Maximum Case
Arsenic	1.77E+01	6.34E+01	6.44E-07	9.61E-06	2.09E-08	7.35E-08	6.65E-07	1.70E-05	2.0E+00	1E-06	3E-05
Benzene	1.00E-03	1.00E-03	3.84E-11	1.52E-10	2.95E-11	9.66E-10	6.59E-11	1.12E-09	2.9E-02	2E-12	3E-11
Bis(2-ethylhexyl)phthalate	1.11E+00	4.70E+00	6.05E-09	3.56E-07	3.94E-10	5.45E-07	6.45E-09	9.01E-07	1.4E-02	9E-11	1E-08
Chloroform	6.00E-03	1.40E-02	2.18E-10	2.12E-09	1.77E-10	1.35E-08	3.95E-10	1.56E-08	6.1E-03	2E-12	1E-10
n-Nitroso-dipropylamine	4.13E-01	5.70E-01	1.50E-08	8.64E-08	1.22E-08	5.51E-07	2.72E-08	6.37E-07	7.0E+00	2E-07	4E-06
n-Nitrosodiphenylamine	1.60E-01	1.60E-01	5.82E-09	2.42E-08	4.73E-09	1.55E-07	1.05E-08	1.79E-07	4.9E-03	5E-11	9E-10
PAH--cPAH	4.91E+00	5.89E+01	2.68E-08	4.46E-06	5.22E-09	4.55E-06	3.20E-08	9.01E-06	1.2E+01	4E-07	1E-04
TOTAL	---	---	---	---	---	---	---	---	---	2E-06	1E-04

NONCARCINOGENS

Chemical	Sediment Concentration (a) (mg/kg)		Quantity of Chemical Ingested and Absorbed (b) (mg/kg-day)		Quantity of Chemical Absorbed Dermally (c) (mg/kg-day)		Combined Chronic Daily Intake (CDI) (d) (mg/kg-day)		Reference Dose (RfD) (e) (mg/kg-day)	Ratio CDI:RfD (g)	
	Geometric Mean	Maximum	Average Case	Plausible Maximum Case	Average Case	Plausible Maximum Case	Average Case	Plausible Maximum Case		Average Case	Plausible Maximum Case
Antimony	1.89E+01	2.20E+01	8.02E-06	3.89E-05	2.61E-07	2.97E-05	8.28E-06	6.86E-05	4.0E-04	2E-02	2E-01
Arsenic	1.77E+01	6.34E+01	7.51E-06	1.12E-04	2.44E-07	8.57E-05	7.75E-06	1.98E-04	1.0E-03	8E-03	2E-01
Barium	1.72E+02	8.17E+02	7.30E-05	1.09E-03	2.37E-06	8.34E-04	7.53E-05	1.92E-03	5.0E-02	2E-03	4E-02
Bis(2-ethylhexyl)phthalate	1.11E+00	4.70E+00	7.06E-08	4.15E-06	4.59E-09	6.36E-06	7.52E-08	1.05E-05	2.0E-02	4E-06	5E-04
Cadmium	3.10E+00	5.00E+00	1.32E-06	8.84E-06	4.27E-08	6.76E-06	1.36E-06	1.56E-05	1.0E-03	1E-03	2E-02
Chloroform	6.00E-03	1.40E-02	2.55E-09	2.47E-08	2.07E-09	1.58E-07	4.61E-09	1.83E-07	1.0E-02	5E-07	2E-05
Mercury	1.60E+00	9.00E+00	6.79E-07	1.59E-05	2.21E-08	1.22E-05	7.01E-07	2.81E-05	3.0E-04	2E-03	9E-02
HAZARD INDEX	---	---	---	---	---	---	---	---	---	<1 (3E-2)	<1 (5E-1)

(a) Concentrations as reported in Table 5-12.
(b) See text for methodology. Calculated using equation 1 and assumptions presented in Table 5-23 and in the text.
(c) See text for methodology. Calculated using equation 2 and assumptions presented in Table 5-23 and in the text.
(d) Sum of ingestion and dermal intakes.
(e) Reported previously in Table 5-19.
(f) Calculated by multiplying the CDI by the potency factor.
(g) Calculated by dividing the CDI by the RfD.

TABLE 5-27

POTENTIAL EXPOSURES AND RISKS ASSOCIATED WITH INCIDENTAL INGESTION AND DERMAL ABSORPTION BY CHILDREN OF CHEMICALS IN SEDIMENT FROM THE HACKENSACK RIVER DOWNGRADIENT OF THE DITCH AT THE WESTERN CORNER OF THE CAPPED LANDFILL (CURRENT LAND USE)

POTENTIAL CARCINOGENS

Chemical	Sediment Concentration (a) (mg/kg)	Quantity of Chemical Ingested and Absorbed (b) (mg/kg-day)		Quantity of Chemical Absorbed Dermally (c) (mg/kg-day)		Combined Chronic Daily Intake (CDI) (d) (mg/kg-day)		Potency Factor (e) (mg/kg-day)-1	Lifetime Upper Bound Excess Cancer Risk (f)	
		Average Case	Plausible Maximum Case	Average Case	Plausible Maximum Case	Average Case	Plausible Maximum Case		Average Case	Plausible Maximum Case
Benzene	6.00E-01	2.91E-08	1.21E-07	2.36E-08	7.73E-07	5.27E-08	8.94E-07	2.9E-02	2E-09	3E-08
Bis(2-ethylhexyl)phthalate	4.90E+01	2.87E-07	3.71E-06	1.74E-08	5.68E-06	2.85E-07	9.39E-06	1.4E-02	4E-09	1E-07
PAH--cPAH	1.08E+01	5.89E-08	8.18E-07	1.15E-08	8.34E-07	7.04E-08	1.65E-06	1.2E+01	8E-07	2E-05
TOTAL	---	---	---	---	---	---	---	---	8E-07	2E-05

NONCARCINOGENS

Chemical	Sediment Concentration (a) (mg/kg)	Quantity of Chemical Ingested and Absorbed (b) (mg/kg-day)		Quantity of Chemical Absorbed Dermally (c) (mg/kg-day)		Combined Chronic Daily Intake (CDI) (d) (mg/kg-day)		Reference Dose (RfD) (e) (mg/kg-day)	Ratio CDI:RfD (g)	
		Average Case	Plausible Maximum Case	Average Case	Plausible Maximum Case	Average Case	Plausible Maximum Case		Average Case	Plausible Maximum Case
Bis(2-ethylhexyl)phthalate	4.90E+01	3.12E-06	4.33E-05	2.03E-07	6.63E-05	3.32E-06	1.10E-04	2.0E-02	2E-04	5E-03
2-Butanone	4.40E+01	1.87E-05	7.78E-05	1.52E-05	4.96E-04	3.38E-05	5.74E-04	5.0E-02	7E-04	1E-02
Di-n-butylphthalate	9.80E-01	4.16E-07	1.73E-06	3.38E-07	1.10E-05	7.54E-07	1.28E-05	1.0E-01	8E-06	1E-04
Ethylbenzene	5.50E+00	2.33E-06	9.72E-06	1.90E-06	6.20E-05	4.23E-06	7.17E-05	1.0E-01	4E-05	7E-04
Mercury	2.00E-01	8.48E-08	3.54E-07	2.76E-09	2.70E-07	8.76E-08	6.24E-07	3.0E-04	3E-04	2E-03
PAH--ncPAH	1.85E+01	1.18E-06	1.63E-05	7.65E-07	4.17E-05	1.94E-06	5.80E-05	4.0E-01	5E-06	1E-04
Selenium	5.00E-01	2.12E-07	8.84E-07	6.89E-09	6.76E-07	2.19E-07	1.56E-06	3.0E-03	7E-05	5E-04
1,1,1-Trichloroethane	1.30E+00	5.51E-07	2.30E-06	4.48E-07	1.46E-05	1.00E-06	1.69E-05	9.0E-02	1E-05	2E-04
HAZARD INDEX	---	---	---	---	---	---	---	---	<1 (1E-3)	<1 (2E-2)

(a) Concentrations as reported in Table 5-13.
(b) See text for methodology. Calculated using equation 1 and assumptions presented in Table 5-23 and in the text.
(c) See text for methodology. Calculated using equation 2 and assumptions presented in Table 5-23 and in the text.
(d) Sum of ingestion and dermal intakes.
(e) Reported previously in Table 5-19.
(f) Calculated by multiplying the CDI by the potency factor.
(g) Calculated by dividing the CDI by the RfD.

TABLE 5-29

POTENTIAL EXPOSURES AND RISKS ASSOCIATED WITH DERMAL ABSORPTION BY CHILDREN OF CHEMICALS IN SURFACE WATER IN THE SIP AVENUE DITCH (CURRENT LAND USE)

POTENTIAL CARCINOGENS

Chemical	Surface Water Concentration (a) (mg/l)		Chronic Daily Intake (CDI) (b) (mg/kg-day)		Potency Factor (c) (mg/kg-day)-1	Lifetime Upper Bound Excess Cancer Risk (d)	
	Geometric Mean	Maximum	Average Case	Plausible Maximum Case		Average Case	Plausible Maximum Case
Arsenic	1.70E-03	4.50E-03	1.09E-09	1.96E-08	2.0E+00	2E-09	4E-08
Benzene	5.50E-03	1.60E-01	3.52E-09	6.98E-07	2.9E-02	1E-10	2E-08
Bis(2-chloroethyl)ether	1.24E-02	4.40E-02	7.94E-09	1.92E-07	1.1E+00	9E-09	2E-07
Bis(2-chloroisopropyl)ether	1.11E-02	2.10E-02	7.10E-09	9.16E-08	7.0E-02	5E-10	6E-09
Bis(2-ethylhexyl)phthalate	2.35E-02	1.70E-01	1.50E-08	7.42E-07	1.4E-02	2E-10	1E-08
Chlordane	4.00E-04	1.60E-03	2.56E-10	6.98E-09	1.3E+00	3E-10	9E-09
Chloroform	4.20E-03	1.00E-02	2.69E-09	4.36E-08	6.1E-03	2E-11	3E-10
n-Nitrosodiphenylamine	9.20E-03	1.30E-02	5.89E-09	5.67E-08	4.9E-03	3E-11	3E-10
TOTAL	---	---	---	---	---	1E-08	3E-07

NONCARCINOGENS

Chemical	Surface Water Concentration (a) (mg/l)		Chronic Daily Intake (CDI) (b) (mg/kg-day)		Reference Dose (RfD) (c) (mg/kg-day)	Ratio CDI:RfD (e)	
	Geometric Mean	Maximum	Average Case	Plausible Maximum Case		Average Case	Plausible Maximum Case
Arsenic	1.70E-03	4.50E-03	1.27E-08	2.29E-07	1.0E-03	1E-05	2E-04
Barium	2.15E-01	1.56E+00	1.61E-06	7.94E-05	5.0E-02	3E-05	2E-03
Bis(2-chloroisopropyl)ether	1.11E-02	2.10E-02	8.29E-08	1.07E-06	4.0E-02	2E-06	3E-05
Bis(2-ethylhexyl)phthalate	2.35E-02	1.70E-01	1.75E-07	8.65E-06	2.0E-02	9E-06	4E-04
Chlordane	4.00E-04	1.60E-03	2.99E-09	8.14E-08	6.0E-05	5E-05	1E-03
Chloroform	4.20E-03	1.00E-02	3.14E-08	5.09E-07	1.0E-02	3E-06	5E-05
Chromium	1.85E-02	5.70E-02	1.38E-07	2.90E-06	5.0E-03	3E-05	6E-04
Ethylbenzene	1.05E-02	4.10E-01	7.84E-08	2.09E-05	1.0E-01	8E-07	2E-04
Manganese	2.11E-01	8.20E-01	1.58E-06	4.17E-05	2.0E-01	8E-06	2E-04
Mercury	2.00E-04	7.00E-04	1.49E-09	3.56E-08	3.0E-04	5E-06	1E-04
Nickel	1.99E-02	9.00E-02	1.49E-07	4.58E-06	2.0E-02	7E-06	2E-04
Vanadium	1.02E-02	3.10E-02	7.62E-08	1.58E-06	7.0E-03	1E-05	2E-04
Zinc	2.28E-01	2.31E-01	1.70E-06	1.18E-05	2.0E-01	9E-06	6E-05
HAZARD INDEX	---	---	---	---	---	<1 (2E-4)	<1 (5E-3)

(a) Concentrations as reported in Table 5-8.
(b) See text for methodology. Calculated using equation 4 and assumptions presented in Table 5-28.
(c) Reported previously in Table 5-19.
(d) Calculated by multiplying the CDI by the potency factor.
(e) Calculated by dividing the CDI by the RfD.

TABLE 5-30

POTENTIAL EXPOSURES AND RISKS ASSOCIATED WITH INCIDENTAL INGESTION AND DERMAL ABSORPTION BY CHILDREN OF CHEMICALS IN SURFACE WATER IN THE HACKENSACK RIVER ABOVE THE SIP AVENUE DITCH (CURRENT LAND USE)

POTENTIAL CARCINOGENS

Chemical	Surface Water Concentration (a) (mg/l)		Quantity of Chemical Ingested and Absorbed (b) (mg/kg-day)		Quantity of Chemical Absorbed Dermally (c) (mg/kg-day)		Combined Chronic Daily Intake (CDI) (d) (mg/kg-day)		Potency Factor (e) (mg/kg-day)-1	Lifetime Upper Bound Excess Cancer Risk (f)	
	Geometric Mean	Maximum	Average Case	Plausible Maximum Case	Average Case	Plausible Maximum Case	Average Case	Plausible Maximum Case		Average Case	Plausible Maximum Case
Benzene	3.40E-03	9.00E-03	3.09E-08	3.41E-07	1.03E-08	1.13E-07	4.12E-08	4.54E-07	2.9E-02	1E-09	1E-08

NONCARCINOGENS

Chemical	Surface Water Concentration (a) (mg/l)		Quantity of Chemical Ingested and Absorbed (b) (mg/kg-day)		Quantity of Chemical Absorbed Dermally (c) (mg/kg-day)		Combined Chronic Daily Intake (CDI) (d) (mg/kg-day)		Reference Dose (RfD) (e) (mg/kg-day)	Ratio CDI:RfD (g)	
	Geometric Mean	Maximum	Average Case	Plausible Maximum Case	Average Case	Plausible Maximum Case	Average Case	Plausible Maximum Case		Average Case	Plausible Maximum Case
Acetone	5.80E-02	5.80E-02	7.21E-06	3.00E-05	2.40E-06	1.00E-05	9.61E-06	4.00E-05	1.0E-01	1E-04	4E-04
Barium	7.01E-02	2.64E-01	7.43E-06	1.17E-04	2.47E-06	3.88E-05	9.91E-06	1.55E-04	5.0E-02	2E-04	3E-03
Beryllium	8.00E-04	1.00E-03	8.48E-08	4.42E-07	2.82E-08	1.47E-07	1.13E-07	5.89E-07	5.0E-03	2E-05	1E-04
Chromium	1.55E-02	3.30E-02	1.64E-06	1.46E-05	5.47E-07	4.85E-06	2.19E-06	1.94E-05	5.0E-03	4E-04	4E-03
Copper	1.77E-02	8.80E-02	1.88E-06	3.89E-05	6.25E-07	1.29E-05	2.50E-06	5.18E-05	3.7E-02	7E-05	1E-03
Manganese	1.55E-01	3.78E-01	1.64E-05	1.67E-04	5.47E-06	5.56E-05	2.19E-05	2.23E-04	2.0E-01	1E-04	1E-03
Mercury	3.00E-04	6.00E-04	3.18E-08	2.65E-07	1.06E-08	8.82E-08	4.24E-08	3.53E-07	3.0E-04	1E-04	1E-03
Zinc	2.04E-01	2.13E-01	2.16E-05	9.41E-05	7.20E-06	3.13E-05	2.88E-05	1.25E-04	2.0E-01	1E-04	6E-04
HAZARD INDEX	---	---	---	---	---	---	---	---	---	<1 (1E-3)	<1 (1E-2)

(a) Concentrations as reported in Table 5-9.
(b) See text for methodology. Calculated using equation 3 and assumptions presented in Table 5-28.
(c) See text for methodology. Calculated using equation 4 and assumptions presented in Table 5-28.
(d) Sum of ingestion and dermal intakes.
(e) Reported previously in Table 5-19.
(f) Calculted by multiplying the CDI by the potency factor.
(g) Calculated by dividing the CDI by the RfD.

TABLE 5-31

POTENTIAL EXPOSURES AND RISKS ASSOCIATED WITH INCIDENTAL INGESTION AND DERMAL ABSORPTION BY CHILDREN OF CHEMICALS IN SURFACE WATER IN THE HACKENSACK RIVER DOWNGRADIENT OF THE DITCH AT THE WESTERN CORNER OF THE CAPPED LANDFILL (CURRENT LAND USE)

NONCARCINOGENS

Chemical	Surface Water Concentration (a) (mg/kg)	Quantity of Chemical Ingested and Absorbed (b) (mg/kg-day)		Quantity of Chemical Absorbed Dermally (c) (mg/kg-day)		Combined Chronic Daily Intake (CDI) (d) (mg/kg-day)		Reference Dose (RfD) (e) (mg/kg-day)	Ratio CDI:RfD (f)	
		Average Case	Plausible Maximum Case	Average Case	Plausible Maximum Case	Average Case	Plausible Maximum Case		Average Case	Plausible Maximum Case
Barium	2.80E-02	2.97E-06	1.24E-05	9.88E-07	4.12E-06	3.96E-06	1.65E-05	5.0E-02	8E-05	3E-04
Chromium	1.20E-02	1.27E-06	5.30E-06	4.24E-07	1.76E-06	1.70E-06	7.07E-06	5.0E-03	3E-04	1E-03
Copper	5.00E-03	5.30E-07	2.21E-06	1.76E-07	7.35E-07	7.07E-07	2.94E-06	3.7E-02	2E-05	8E-05
Di-n-butylphthalate	1.20E-02	1.27E-06	5.30E-06	4.24E-07	1.76E-06	1.70E-06	7.07E-06	1.0E-01	2E-05	7E-05
Manganese	1.15E-01	1.22E-05	5.08E-05	4.06E-06	1.69E-05	1.63E-05	6.77E-05	2.0E-01	8E-05	3E-04
Mercury	1.00E-03	1.06E-07	4.42E-07	3.53E-08	1.47E-07	1.41E-07	5.89E-07	3.0E-04	5E-04	2E-03
Zinc	2.16E-01	2.29E-05	9.54E-05	7.62E-06	3.18E-05	3.05E-05	1.27E-04	2.0E-01	2E-04	6E-04
HAZARD INDEX	---	---	---	---	---	---	---	---	<1 (1E-3)	<1 (5E-3)

(a) *Concentrations as reported in Table 5-10.*
(b) See text for methodology. Calculated using equation 3 and assumptions presented in Table 5-28.
(c) See text for methodology. Calculated using equation 4 and assumptions presented in Table 5-28.
(d) Sum of ingestion and dermal intakes.
(e) Reported previously in Table 5-19.
(f) Calculated by dividing the CDI by the RfD.

TABLE 5-35

POTENTIAL EXPOSURES AND RISKS ASSOCIATED WITH INHALATION OF VOLATILE CHEMICALS BY TRESPASSING CHILDREN
(CURRENT LAND USE)

POTENTIAL CARCINOGENS

Chemical	Estimated Air Concentration (a) (mg/m3)		Chronic Daily Intake (CDI) (b) (mg/kg-day)		Potency Factor (c) (mg/kg-day)-1	Lifetime Upper Bound Excess Cancer Risk (d)	
	Average	Maximum	Average Case	Plausible Maximum Case		Average Case	Plausible Maximum Case
Benzene	1.31E-05	6.74E-04	1.10E-08	5.02E-06	2.9E-02	3E-10	1E-07
Chloroform	1.89E-07	2.02E-05	1.58E-10	1.51E-07	8.1E-02	1E-11	1E-08
Methylene chloride	4.21E-07	7.66E-05	3.52E-10	5.71E-07	1.4E-02	5E-12	8E-09
Tetrachloroethene	9.68E-07	2.91E-04	8.10E-10	2.17E-06	3.3E-03	3E-12	7E-09
Trichloroethene	7.74E-07	2.91E-04	6.47E-10	2.17E-06	4.6E-03	3E-12	1E-08
Vinyl Chloride	1.50E-06	8.57E-04	1.25E-09	6.39E-06	2.9E-01	4E-10	2E-06
TOTAL	---	---	---	---	---	7E-10	2E-06

NONCARCINOGENS

Chemical	Estimated Air Concentration (a) (mg/m3)		Chronic Daily Intake (CDI) (b) (mg/kg-day)		Reference Dose (RfD) (c) (mg/kg-day)	Ratio CDI:RfD (e)	
	Average	Maximum	Average Case	Plausible Maximum Case		Average Case	Plausible Maximum Case
Chlorobenzene	2.61E-06	7.96E-05	2.55E-08	6.92E-06	5.0E-03	5E-06	1E-03
1,1-Dichloroethane	6.29E-07	2.51E-04	6.14E-09	2.18E-05	1.0E-01	6E-08	2E-04
Methylene chloride	4.21E-07	7.66E-05	4.11E-09	6.66E-06	8.6E-01	5E-09	8E-06
Toluene	7.74E-06	1.44E-03	7.55E-08	1.25E-04	5.7E-01	1E-07	2E-04
1,1,1-Trichloroethane	2.08E-07	1.44E-04	2.03E-09	1.25E-05	3.0E-01	7E-09	4E-05
Xylenes	1.98E-05	4.81E-03	1.93E-07	4.18E-04	4.0E-01	5E-07	1E-03
HAZARD INDEX	---	---	---	---	---	<1 (6E-6)	<1 (3E-3)

(a) Concentrations as reported in Table 5-18.
(b) See text for methodology. Calculated using equation 5 and assumptions presented in Table 5-32.
(c) Reported previously in Table 5-19.
(d) Calculted by multiplying the CDI by the potency factor.
(e) Calculated by dividing the CDI by the RfD.

TABLE 5-36

POTENTIAL EXPOSURES AND RISKS ASSOCIATED WITH INHALATION OF VOLATILE CHEMICALS BY NEARBY WORKERS
(CURRENT LAND USE)

POTENTIAL CARCINOGENS

Chemical	Estimated Air Concentration (a) (mg/m3)		Chronic Daily Intake (CDI) (b) (mg/kg-day)		Potency Factor (c) (mg/kg-day)-1	Lifetime Upper Bound Excess Cancer Risk (d)	
	Average	Maximum	Average Case	Plausible Maximum Case		Average Case	Plausible Maximum Case
Benzene	6.11E-06	4.15E-05	8.61E-08	4.34E-06	2.9E-02	2E-09	1E-07
Chloroform	8.83E-08	5.99E-07	1.24E-09	6.27E-08	8.1E-02	1E-10	5E-09
Methylene chloride	1.97E-07	1.34E-06	2.78E-09	1.40E-07	1.4E-02	4E-11	2E-09
Tetrachloroethene	4.53E-07	3.07E-06	6.38E-09	3.21E-07	3.3E-03	2E-11	1E-09
Trichloroethene	3.62E-07	2.46E-05	5.10E-09	2.57E-06	4.6E-03	2E-11	1E-08
Vinyl Chloride	7.02E-07	4.76E-06	9.89E-09	4.98E-07	2.9E-01	3E-09	1E-07
TOTAL	---	---	---	---	---	6E-09	3E-07

NONCARCINOGENS

Chemical	Estimated Air Concentration (a) (mg/m3)		Chronic Daily Intake (CDI) (b) (mg/kg-day)		Reference Dose (RfD) (c) (mg/kg-day)	Ratio CDI:RfD (e)	
	Average	Maximum	Average Case	Plausible Maximum Case		Average Case	Plausible Maximum Case
Chlorobenzene	1.22E-06	8.30E-06	1.34E-07	2.03E-06	5.0E-03	3E-05	4E-04
1,1-Dichloroethane	2.94E-07	2.00E-06	3.22E-08	4.88E-07	1.0E-01	3E-07	5E-06
Methylene chloride	1.97E-07	1.34E-06	2.16E-08	3.27E-07	8.6E-01	3E-08	4E-07
Toluene	3.62E-06	2.46E-05	3.97E-07	6.01E-06	5.7E-01	7E-07	1E-05
1,1,1-Trichloroethane	9.73E-08	6.61E-07	1.07E-08	1.61E-07	3.0E-01	4E-08	5E-07
Xylenes	9.28E-06	6.30E-05	1.02E-06	1.54E-05	4.0E-01	3E-06	4E-05
HAZARD INDEX	---	---	---	---	---	<1 (3E-5)	<1 (5E-4)

(a) Concentrations as reported in Table 5-18.
(b) See text for methodology. Calculated using equation 5 and assumptions presented in Table 5-33.
(c) Reported previously in Table 5-19.
(d) Calculted by multiplying the CDI by the potency factor.
(e) Calculated by dividing the CDI by the RfD.

TABLE 5-37

POTENTIAL EXPOSURES AND RISKS ASSOCIATED WITH INHALATION OF VOLATILE CHEMICALS BY NEARBY RESIDENTS
(CURRENT LAND USE)

POTENTIAL CARCINOGENS

Chemical	Estimated Air Concentration (a) (mg/m3)		Chronic Daily Intake (CDI) (b) (mg/kg-day)		Potency Factor (c) (mg/kg-day)-1	Lifetime Upper Bound Excess Cancer Risk (d)	
	Average	Maximum	Average Case	Plausible Maximum Case		Average Case	Plausible Maximum Case
Benzene	2.51E-07	3.50E-07	4.83E-09	4.56E-08	2.9E-02	1E-10	1E-09
Chloroform	3.63E-09	5.06E-09	7.13E-11	6.60E-10	8.1E-02	6E-12	5E-11
Methylene chloride	8.09E-09	1.13E-08	1.59E-10	1.47E-09	1.4E-02	2E-12	2E-11
Tetrachloroethene	1.86E-08	2.59E-08	3.66E-10	3.38E-09	3.3E-03	1E-12	1E-11
Trichloroethene	1.49E-08	2.08E-08	2.93E-10	2.71E-09	4.6E-03	1E-12	1E-11
Vinyl Chloride	2.88E-08	4.02E-08	5.66E-10	5.24E-09	2.9E-01	2E-10	2E-09
TOTAL	---	---	---	---	---	3E-10	3E-09

NONCARCINOGENS

Chemical	Estimated Air Concentration (a) (mg/m3)		Chronic Daily Intake (CDI) (b) (mg/kg-day)		Reference Dose (RfD) (c) (mg/kg-day)	Ratio CDI:RfD (e)	
	Average	Maximum	Average Case	Plausible Maximum Case		Average Case	Plausible Maximum Case
Chlorobenzene	5.02E-08	7.00E-08	7.67E-09	2.13E-08	5.0E-03	2E-06	4E-06
1,1-Dichloroethane	1.21E-08	1.69E-08	1.85E-09	5.14E-09	1.0E-01	2E-08	5E-08
Methylene chloride	8.09E-09	1.13E-08	1.24E-09	3.44E-09	8.6E-01	1E-09	4E-09
Toluene	1.49E-07	2.08E-07	2.28E-08	6.33E-08	5.7E-01	4E-08	1E-07
1,1,1-Trichloroethane	4.00E-09	5.58E-09	6.12E-10	1.70E-09	3.0E-01	2E-09	6E-09
Xylenes	3.81E-07	5.32E-07	5.82E-08	1.62E-07	4.0E-01	1E-07	4E-07
HAZARD INDEX	---	---	---	---	---	<1 (2E-6)	<1 (5E-6)

(a) Concentrations as reported in Table 5-18.
(b) See text for methodology. Calculated using equation 5 and assumptions presented in Table 5-34.
(c) Reported previously in Table 5-19.
(d) Calculted by multiplying the CDI by the potency factor.
(e) Calculated by dividing the CDI by the RfD.

TABLE 5-39

POTENTIAL EXPOSURES AND RISKS ASSOCIATED WITH INGESTION OF CHEMICALS IN GROUNDWATER
(HYPOTHETICAL FUTURE LAND USE)

POTENTIAL CARCINOGENS

Chemical	Groundwater Concentration (a) (mg/l)		Chronic Daily Intake (CDI) (b) (mg/kg-day)		Potency Factor (c) (mg/kg-day)-1	Lifetime Upper Bound Excess Cancer Risk (d)	
	Geometric Mean	Maximum	Average Case	Plausible Maximum Case		Average Case	Plausible Maximum Case
Arsenic	4.70E-03	4.81E-02	1.16E-05	5.89E-04	2.0E+00	2E-05	1E-03
Benzene	6.10E-03	5.80E-01	1.50E-05	7.10E-03	2.9E-02	4E-07	2E-04
Bis(2-chloroethyl)ether	9.20E-03	2.00E-01	2.27E-05	2.45E-03	1.1E+00	2E-05	3E-03
Bis(2-chloroisopropyl)ether	8.90E-03	1.02E-01	2.19E-05	1.25E-03	7.0E-02	2E-06	9E-05
Chloroform	2.80E-03	1.00E-02	6.90E-06	1.22E-04	6.1E-03	4E-08	7E-07
Methylene chloride	2.79E-02	5.80E-02	6.88E-05	6.86E-04	7.5E-03	5E-07	5E-06
TOTAL	---	---	---	---	---	5E-05	4E-03

NONCARCINOGENS

Chemical	Groundwater Concentration (a) (mg/l)		Chronic Daily Intake (CDI) (b) (mg/kg-day)		Reference Dose (RfD) (c) (mg/kg-day)	Ratio CDI:RfD (e)	
	Geometric Mean	Maximum	Average Case	Plausible Maximum Case		Average Case	Plausible Maximum Case
Antimony	5.18E-02	1.13E-01	9.93E-04	3.23E-03	4.0E-04	2E+00	8E+00
Arsenic	4.70E-03	4.81E-02	9.01E-05	1.37E-03	1.0E-03	9E-02	1E+00
Barium	5.99E-01	1.74E+00	1.15E-02	4.97E-02	5.0E-02	2E-01	1E+00
Bis(2-chloroisopropyl)ether	8.90E-03	1.02E-01	1.71E-04	2.91E-03	4.0E-02	4E-03	7E-02
Cadmium	2.80E-03	2.30E-02	5.37E-05	6.57E-04	5.0E-04	1E-01	1E+00
Chloroform	2.80E-03	1.00E-02	5.37E-05	2.86E-04	1.0E-02	5E-03	3E-02
Chromium	2.77E-02	1.35E+00	5.31E-04	3.86E-02	5.0E-03	1E-01	8E+00
Copper	2.31E-02	8.56E-01	4.43E-04	2.45E-02	3.7E-02	1E-02	7E-01
Manganese	5.82E-01	4.19E+00	1.12E-02	1.20E-01	2.0E-01	6E-02	6E-01
Mercury	4.00E-04	2.27E-02	7.67E-06	6.49E-04	3.0E-04	3E-02	2E+00
Methylene chloride	2.79E-02	5.60E-02	5.35E-04	1.60E-03	6.0E-02	9E-03	3E-02
Nickel	2.61E-02	2.10E-01	5.01E-04	6.00E-03	2.0E-02	3E-02	3E-01
Thallium	2.10E-03	1.32E-02	4.03E-05	3.77E-04	7.0E-03	6E-03	5E-02
Zinc	2.11E-01	4.18E+00	4.05E-03	1.19E-01	2.0E-01	2E-02	6E-01
HAZARD INDEX	---	---	---	---	---	>1 (3)	>1 (20)

(a) Concentrations as reported in Table 5-7.
(b) See text for methodology. Calculated using equation 6 and assumptions presented in text.
(c) Reported previously in Table 5-19.
(d) Calculted by multiplying the CDI by the potency factor.
(e) Calculated by dividing the CDI by the RfD.

APPENDIX III

ADMINISTRATIVE RECORD INDEX

Items Sent To Repository For PJP Landfill:

1.	Report of Health Effects Advisory Committee	12/7/88
2.	Community Respiratory Status Relative to Burning Landfill	12/7/88
3.	NJ Bill 2661	12/7/88
4.	Supplement to Directive and Notice to Insurers Directive	5/17/88
5.	Community Relations Plan/Transcript of 12/7/88 Public Meeting	10/20/89
6.	HASP, FSP-QAPP	12/15/89
7.	RI Report Appendices A-S	12/5/91
8.	Background Investigation Report	11/21/91
9.	Buried Drum Investigation Report (Appendix A)	11/21/91
10.	Phase I RI	11/21/9
11.	Phase I, II & III FS	
12.	PJP Landfill - Interim Remedial Measures Health & Safety Volume I & II	
13.	Site Characterization Study Siegel Property	10/84
14.	Work Plan for Handling Hazardous Waste Drums and Other Containers	10/17/85
15.	PJP Landfill Interim Remedial Measure - Final Design Report	5/85
16.	PJP Landfill - Interim Remedial Measure - Final Report	
17.	PJP Landfill PRP Steering Committee - Comments of the Phase I Remedial Investigation for the PJP Landfill Site	1/92
18.	Volume 1 - Case Narrative - Characterization of Landfill Gases at PJP	
19.	D'Annunzio Associates - Project Plan including Health Safety Plan and Drum Handling Plan	
20.	D'Annunzio Associates - Fire & Hazardous Situation Contract	

21.	Final Report - PJP Landfill Bedrock Monitoring Well Information	
22.	Work Plan and Health and Safety Plan - PJP Landfill	8/11/93
23.	Chronic Bio Monitoring Report	12/7/93
24.	Field Sampling Episode Report - PJP Landfill	11/4&5/93
25.	PJP - Summary of November 1993 Sampling of Surface Water and Sedimentation	
26.	Letter "Notifying Potential Liability"	8/10/94
27.	Letter "Directive & Notice to Insurer Number Two"	8/22/89
28.	Letter "PJP Landfill Supplement to directive and Notice to Insurer Number One and Demand For Payment and its amendment	3/17/89
29.	Letter "Multi-Site Directive and Notice to Insure"	5/7/90
30.	Record of Decision for PJP Landfill Superfund Site, NJDEP	9/28/95
31.	Maps, Surveys and Slides of PJP Landfill Superfund Site, Various dates (only located in NJDEP's Repository)	

APPENDIX IV

EPA's LETTER OF CONCURRENCE

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY - REGION II
290 BROADWAY
NEW YORK, NEW YORK 10007-1866

SEP 27 1995

Honorable Robert C. Shinn, Jr.
Commissioner
State of New Jersey
Department of Environmental Protection
401 East State Street
Trenton, New Jersey 08625

Re: EPA Concurrence of Selected Remedy
for PJP Landfill Superfund Site

Dear Commissioner Shinn:

This is to notify you that the Environmental Protection Agency (EPA) has reviewed the Record of Decision prepared by the New Jersey Department of Environmental Protection (NJDEP) for the PJP Landfill site. Based on this review, EPA concurs with the selected remedy to address contaminated surface soils and ground water at the site.

The major components of the selected remedy include the following:

- Removal of all known and suspected buried drum materials and associated visibly contaminated soil;
- Capping of the exposed landfill area of the site with a multi-layer, modified solid waste cap in accordance with NJDEP guidance;
- Installation of an appropriate gas venting system;
- Extension of the existing gravel-lined ditch around the perimeter of the site to collect surface water runoff;
- Replacement of the Sip Avenue ditch with an alternate form of drainage;
- Site fencing and institutional controls (e.g., land use restrictions and classification exemption/well restriction area);
- Routine inspections, maintenance and a reevaluation of the previously capped area of the landfill;
- Ground water and surface water monitoring to evaluate the reduction of contaminant concentrations over time and otherwise ensure the effectiveness of the remedy;
- Modeling to demonstrate the effectiveness of the cap in reducing the migration of ground water leachate from the landfill to the Hackensack River; and
- Implementation of a wetlands assessment and restoration plan.

In addition to the remedial components identified above, the Comprehensive Environmental Response, Compensation and Liability Act, as amended, requires that the site be reviewed every five years because contaminants will remain on the site above health-based levels. The purpose of these reviews is to ensure that the selected remedy continues to provide adequate protection of human health and the environment. Further, if monitoring indicates that the landfill cap alone is not effective in reducing the migration of contaminants to ground and surface waters, additional remedial actions may be necessary.

We look forward to a continued cooperative working relationship with the Department to address the environmental concerns at this and other Superfund sites in New Jersey. If you have any questions regarding this concurrence letter, please do not hesitate to contact me at (212) 637-5000, or have your staff contact John Frisco, Deputy Director for New Jersey Programs, at (212) 637-4400.

Sincerely,

Jeanne M. Fox
Regional Administrator

RECORD OF DECISION
RESPONSIVENESS SUMMARY

PJP Landfill Site

Jersey City, Hudson County, New Jersey

New Jersey Department of Environmental Protection
Site Remediation Program
Trenton, New Jersey

Responsiveness Summary
PJP Landfill Superfund Site

This responsiveness summary is divided into the following sections:

A. Overview

B. Background on Community Involvement and Concerns

C. Summary of Comments Received During the Public Comment Period and NJDEP/USEPA Responses

A. Overview

This is a summary of the public's comments and questions regarding the Proposed Plan for remediation of the PJP Landfill Superfund site and the New Jersey Department of Environmental Protection's (NJDEP) responses to those comments.

A public comment period was held from August 2, 1994 through September 30, 1994 and was extended, at the request of potential responsible parties, until October 14, 1994. The purpose of the public comment period was to provide interested parties with the opportunity to comment on a Proposed Plan for remediation of the PJP Landfill site. During the public comment period, NJDEP held a public meeting on August 18, 1994 at 7 p.m. at the Jersey City Municipal Building to discuss results of the Remedial Investigation and Feasibility Study (RI/FS) reports and to present the NJDEP's preferred alternative for remediation of the site.

The preferred remedial alternative addresses cleanup remedies for the site that includes landfill material, landfill gas and areas of buried drums and associated contaminated soil. Future monitoring and review requirements also are included for ground water and surface water. The Proposed Plan's preferred remedial alternative includes components of media-specific alternatives developed for remediation of the site in accordance with NJDEP Bureau of Landfill Engineering guidance, New Jersey Solid Waste Regulations regarding closure and post closure requirements for solid waste landfills, the Comprehensive Environmental Response,

Compensation and Liability Act (CERCLA) of 1980, as amended, and Section 300.430(f) of the National Oil and Hazardous Substances Pollution Contingency Plan (NCP). Specifically, this includes: 1) construction of a modified solid waste cap over approximately 42 acres of the landfill area not addressed as part of a 1986 Interim Remedial Measure (IRM); 2) installation of a passive or active gas venting system; 3) replacement of the Sip Avenue Ditch with an alternative form of drainage; and, 4) quarterly ground water monitoring.

B. Background on Community Involvement

NJDEP prepared a community relations plan in June 1985 for the site detailing site history, community concerns and remedial action taken to date. Also, in June 1985, a public meeting was held in Jersey City to discuss NJDEP's plans to extinguish subsurface fires present at the site. A public meeting was held in December 1988 to discuss the initiation of the RI/FS. Briefings for Jersey City officials and their county, state and federal representatives and various surrounding municipalities were held in January 1989. Numerous press releases were distributed to the state-wide media announcing these public meetings and describing remedial work to be performed. An updated mailing list was developed in August 1994 for the site and used to inform interested residents and neighborhood groups as well as various officials about site activities.

C. Summary of Comments Received During the Public Comment Period and NJDEP/USEPA Responses

The majority of comments received during the public comment period originated from the potentially responsible parties. Their comments focused on the definition of landfill parameters, the appropriateness of the preferred cap, future use of the site and the methodology and conclusions of the site risk assessment. One attorney submitted comments on behalf of a PJP potential responsible party group that included an alternate remedy that was presented as equally protective and more cost effective than the NJDEP preferred remedy. Concerns were also raised during the public meeting regarding how reasonable risk is determined and the impact this remediation may have on currently operating facilities in the vicinity of the site. All written comments as well as the transcript of the August 18, 1994 public meeting can be found in the appendices to this Responsiveness Summary.

<u>I. Landfill Definition and Characteristics and Liability Issues</u>

1. Comment: How much of the site is contaminated in cubic yards?

   Response: Various written and photographic records and results of remedial work performed at the PJP Landfill site indicates that the site was used for the disposal of thousands of drums and hundreds of thousands of gallons of chemical waste along with municipal, commercial and industrial refuse. It would be

cost prohibitive to determine whether every cubic yard of the site believed to be used for municipal, commercial and industrial refuse disposal also was contaminated by chemical wastes. Therefore, the goal of the RI was to characterize the different media (i.e., ground water, soils, air, sediment) on a broader scale to determine an appropriate response to mitigate potential adverse impacts on human health and the environment.

A 45-acre capped portion of the site contained significant amounts of hazardous materials in the form of drums, cylinders and contaminated soils that were transported off site for permanent disposal. The remainder of the landfill also contains drums and contaminated soils that will be remediated as part of NJDEP's selected remedy noted in the Record of Decision (ROD).

2. Comment: How did the Department arrive at geographic boundaries of what is attributable to PJP? Can you give us an example of some of the kinds of documents or sources you used to determine that the landfill is 87 acres? Also, how do we know the chronology of dumping?

Response: Refer to the response to comment 3.

3. Comment: NJDEP's proposed cap inappropriately coincides with and is defined by the current property boundaries. Proper and adequate delineation of the landfill should have been performed to define what areas need to be capped.

Response: The site description paragraph located on page 2 of the Record of Decision defines those areas NJDEP intends to address as part of its selected remedy for the PJP Landfill site. The site boundaries are based upon studies conducted during the RI, NJDEP's review of reports of inspections conducted during the operation of the PJP Landfill, aerial photographs of the site and documents filed by the PJP operators in 1970. Collectively, these records and the RI/FS confirm that waste disposal activities extended well beyond the blocks and lots originally set forth in the documents filed by the PJP Landfill Company. The Hackensack River, the fenced trucking terminals and Truck Routes 1 and 9 provided geographic limits of the site on the northwest, west, south and east sides. The remedy will extend to the northeast to those parts of lots 3B and 4B in block 1627.1 that are determined during design to have been used for disposal of hazardous substances.

4. Comment: Are logs available of the RI borings?

Response: Yes. logs of the RI borings are contained in the Administrative Record and available for review. The soil borings are in Appendix H of the Phase I RI report, Volume II.

5. Comment: Did the Department perform any investigation to determine whether any of the neighboring sites were contributing to contamination on this site?

Response: The only neighboring site up-gradient from the PJP landfill site is a cemetery to the east, which is not considered to be a likely source of contamination.

6. Comment: How many PRPs are there?

Response: In 1992, NJDEP commenced cost recovery litigation seeking part costs and future costs and damages for the remediation of this Superfund site from entities and individuals alleged to be responsible for hazardous substances disposed at this site. As of September 1995 over 90 direct and third party defendants have been included in this law suit.

7. Comment: Do you have many photographs in the Administrative Record? Do any photographs identify responsible parties for this site?

Response: There are aerial photographs taken during the years the landfill operated in the Administrative Record File at NJDEP offices in Trenton. These photographs have been used to help determine what areas of the site needed to be capped. Also, there are numerous slides and photographs of the PJP Landfill site.

II. Drums Found at Landfill

8. Comment: Approximately how many drums are located at the site?

Response: During NJDEP's IRM project, there were 4,770 intact drums removed from the site for permanent disposal. Also, an indeterminate amount of broken and crushed drums were removed along with contaminated soil.

Two additional areas were found during the RI that contained drums. These areas are included in the ROD as requiring remediation through excavation and off-site disposal. During the IRM pockets of drums usually were found to extend out a significant distance in several directions. Therefore, the current number of drums located at the site is not known and

will not be determined until the excavations are actually performed.

9. Comment: Did any of the drums have markings on them?

Response: During the IRM a separate log sheet was maintained for each of the 4,770 drums noting any markings in addition to a description of the contents of the drum.

10. Comment: Drum removal was not evaluated in the feasibility study and the areas of concern are unclear and inconsistent with the remedial investigation as only two areas have known buried drums, not 12, as DEP has proposed to investigate. Also, there is no criteria for proposed soil removal.

Response: In order for NJDEP's proposed cap to be effective and as suggested by NJDEP's 1993 sampling effort, it is necessary to remediate the two known buried drum areas. These two known buried drum areas actually encompass the approximately 12 test pit areas. Although the exact criteria for soil removal was not included in the Proposed Plan, it does state "associated visibly contaminated soils." The specific criteria for soil removal will be developed during the design phase. Such criteria may include, but not be limited to, the following examples: soils adjacent to or below containers (i.e., drums, barrels, etc.) that have ruptured, leaked or corroded; stained or discolored soils; material that visually appears to have originated (i.e., leaked or spilled) from a container.

III. Site Affects on Sip Avenue Ditch/Hackensack River/Newark Bay

11. Comment: Was any investigation done by the Department to determine whether the Hackensack River or the Sip Avenue Ditch was in any way affecting the site, either positively or negatively?

Response: It is not known whether the Hackensack River is affecting the site. No tidal studies were conducted in the RI. As is stated on page 420 of the RI, "The influence of the tides on [ground water] flow patterns is not known." In the future, if DEP and EPA decide that a ground water remediation is needed for the PJP Landfill site, it may be appropriate to conduct a tidal study. Such a study would be conducted through monitoring the tidal influence upon the wells at the site by continuously monitoring the shallow, deep and bedrock wells.

The Sip Avenue Ditch does not affect the site. The ditch is a discharge point for ground water from both the northern and southern parts of the site, so no contaminants are moving from

the ditch to the landfill. Ground water flow direction was determined during the RI by measuring water levels in site monitor wells. As is stated on page 225 of the RI, "Generally, most of the ground water at the site flows into the SIP Avenue Ditch."

Leachate from the site is flowing into the ditch adding to contaminants already there. During the RI a leachate seep was sampled (Landfill Leachate Sample PJP-SW-011) on the landfill adjacent to the Pulaski Skyway and Sip Avenue Ditch. Results showed total volatile organic compounds of 1,017 parts per billion (ppb). The sample exceeded the Federal Surface Water Quality Criteria for the following compounds: benzene (160 ppb), n-nitrosodiphenylamine (13 ppb), arsenic (4.5 ppb), barium (1,560 ppb), iron (8,410 ppb), manganese (235 ppb), lead (25 ppb) and nickel (90 ppb).

12. Comment: DEP's proposed 15-foot diameter enclosed concrete culvert for the Sip Avenue Ditch is grossly oversized. The proposed culvert is unnecessary to prevent contact with contaminated sediments along the Ditch because the contamination does not exceed the acceptable risk range. Some or all of sediment contaminants within the ditch cannot be attributed to the site because it is a storm water channel for areas beyond the site.

Response: The exact design parameters for the Sip Avenue Ditch culvert will be determined in the design phase. The reference to a 15-foot culvert, which appears in the FS, was an option proposed by NJDEP's contractor to address the Sip Avenue Ditch as part of an overall capping alternative. In order to properly maintain the integrity of the landfill cap, adequately channel surface water runoff and adequately protect human health and the environment, some type of remedial action is necessary for the Ditch.

Also, please refer to the response to comment No. 26 and 40.

13. Comment: There may be a combined sewer overflow emptying into the Sip Avenue Ditch from a truck stop area that would have to be addressed in the remediation.

Response: The design phase of this project will include the replacement of the Sip Avenue Ditch with an alternate form of drainage that takes sewer overflow into account.

14. Comment: Is the leaching of contaminants from the landfill into the Hackensack River directly or indirectly affecting the dredging that is going on in the Newark Bay?

Response: NJDEP does not believe contaminant levels measured during the RI in surface water and sediment at the site will adversely impact adjacent surface waters including the Hackensack River. Consequently, dredging operations in Newark Bay, about two miles downstream from the site, also would not be adversely affected.

IV. Reuse of Site and Affect of Remediation on Adjacent Properties

15. Comment: What steps are being taken to create the best opportunity for potential development in the future of this prime development site? It appears that every time a site gets cleaned up it gets cleaned up to the minimum level that is required. A program needs to exist to try to preserve as much property as possible for future development. Also, why did NJDEP not explore on-site remediation for the site to clean up the land and restore it to the tax base?

Response: In selecting a remedial alternative NJDEP must balance a number of factors including cost effectiveness and the requirement that the chosen remedy adequately protects human health and the environment. While a cleanup plan that calls for excavation and off-site removal of all contaminated waste would leave the site available for unrestricted development, the economics of such an alternative are not feasible because the costs would be prohibitive. Removal and off-site disposal of all landfill materials was examined in the Phase II FS, but was screened out due to excessive cost--approximately $1 billion--in the Phase III FS.

NJDEP's selected remedy will provide adequate protection of human health and the environment. Any proposed development of the PJP Landfill site subsequent to implementation of NJDEP's selected remedy will have to take such work into consideration. This means that the site owners or potential developers may propose to NJDEP and implement, if approved, some type of redevelopment of this site as long as it does not compromise the remedial measures performed.

Also, please refer to the response to comment No. 60.

It should be noted that the M & T Delisa Landfill Superfund site in Ocean Township, New Jersey, currently occupied by the Seaview Square Mall, is the only Superfund site in the state that has been reused. The site was deleted in 1991 from the National Priorities List.

16. Comment: It appears that some currently active properties have been included in the area to be capped. How do you propose to

initiate further actions here while these facilities are still operating?

Response: NJDEP does not intend to disrupt any current large facilities with permanent structures. One aspect of the modified solid waste cap is to prevent additional infiltration into the ground water. Therefore, NJDEP considers areas that have buildings in place and concrete floors already to be capped.

However, the area now occupied by A.T. Autowreckers, which operates a junk yard, will need to be either temporarily or permanently relocated off the site since this area will be capped and investigated for buried drums during the remedial design/action phase.

17. Comment: NJDEP's preferred remedy constitutes a compensable taking under the Fifth Amendment of the U.S. Constitution as private property is being taken for public use. Also, future access requirements for monitoring and maintenance constitutes imposing an easement and requires compensation.

Response: NJDEP believes that the remedial actions it intends to implement at the PJP Landfill site do not constitute a compensable taking under the applicable laws and regulations.

18. Comment: The best use of the site is for light industry or possibly an office or research and development facility. Also, recreational facilities could be constructed to benefit the local community on certain areas of the landfill if an appropriate cap is installed.

Response: Please refer to response to comment No. 15.

V. Recent Illegal Dumping at Site

19. Comment: Comments were made that during the past year and a half about 40,000 to 60,000 yards of fill material very high in polycyclic aromatic hydrocarbons (PAHs), demolition refuse and possibly chemical wastes have been brought to or dumped at properties adjacent to the PJP Landfill site.

Response: NJDEP's solid waste enforcement element has investigated the fill material complaint and ordered the specific property owner to comply with appropriate state laws and regulations that cover the handling of such material. In terms of illegal dumping of chemical wastes, NJDEP has forwarded the comments regarding continued dumping at this site to the New Jersey

Division of Criminal Justice. Those allegations were investigated by that agency.

Much of the site is enclosed with a 10-foot high cyclone fence. While this fence restricts access to much of the site, access can be obtained through a number of business establishments that border the site. The chosen remedy will include security measures that will restrict, to the extent possible, all access to the unoccupied portion of the site.

VI. Costs

20. Comment: How did you arrive at an estimated cost for the NJDEP preferred alternative?

Response: The estimated cost includes calculations for capital costs, annual operation and maintenance costs and a present worth cost. The present worth cost is calculated using both the capital costs and annual operation and maintenance costs. Specifically, the present worth cost is derived from an analysis of expenditures that would occur at different times by discounting all future costs to a common year, usually the current year. The present worth cost is based on a 30-year period and a discount rate of seven percent. This allows the costs of each remedial action alternative to be compared on the basis of a single figure representing the amount of money that, if invested in the base year and dispersed as needed, would be sufficient to cover all costs associated with the remedial action.

21. Comment: What is the margin of error in the cost estimates?

Response: The remedial cost estimates provided in the Proposed Plan can range from 30 percent less than to 50 percent more than the actual remedial costs.

22. Comment: How did you determine the preferred remedy is the most cost-effective?

Response: In accordance with USEPA guidance, a detailed analysis of each remedial alternative in the Proposed Plan was conducted with respect to nine criteria, one of which involves costs. A complete analysis using the nine criteria also is included in the ROD on pages 16 to 20. The criteria in the ROD are divided into three separate references: threshold criteria, primary balancing criteria and modifying criteria.

Under the provisions of P.L. 1993, c.139, Section 35g relating to remedial costs, DEP cannot require a responsible party to

implement a permanent remedy at a contaminated site if a non-permanent remedy can be implemented for less than half the cost. All of the alternatives presented in the NJDEP Proposed Plan were nonpermanent remedies. Consequently, NJDEP's selected remedy noted in the ROD complies with the specific cost provisions of this statute.

23. Comment: Who is paying for the remediation currently and who will pay for the future remediation?

Response: NJDEP paid all costs associated with the RI/FS. Also, the IRM performed by NJDEP was funded almost entirely with state monies. The Roman Catholic Archdiocese of Newark, an owner of a portion of the PJP Landfill site, paid $46,575 toward a study conducted in 1985. Also, $336,824 was paid by a group of potentially responsible parties in 1989 in response to a directive issued to those parties for the funding of the RI/FS. NJDEP is involved in cost recovery litigation seeking past and future costs associated with remediating the site. If the potential responsible parties will not perform future actions, public monies will be used for an engineering design and construction project to implement the ROD and long-term operation and maintenance costs.

VII. Site Risk Issues

24. Comment: What was the worst case scenario used for calculating risks to children from swimming in the Sip Avenue Ditch and what kind of exposure are you talking about?

Response: The maximum plausible scenario is the worst case scenario for calculating risks to children swimming in the Sip Avenue Ditch and is noted in Section 5.0 of the Phase I RI. The maximum plausible scenario is intended to place an upper bound on the potential risks by combining maximum plausible exposure estimates with upper bound health effects criteria. Data used to calculate the plausible maximum case are provided in Table 5-25 of the Phase I RI. They include: sediment concentration, quantity of chemical ingested and absorbed, quantity of chemical absorbed dermally, combined chronic daily intake, potency factor and reference dose.

The exposure pathways evaluated for the Sip Avenue Ditch also are discussed in detail in Section 5.0 of the Phase I RI. Specifically, the potentially exposed population is trespassing children wading in the Sip Avenue Ditch. The exposure pathways evaluated for this population are dermal absorption of chemicals in the Ditch sediment and surface

water and incidental ingestion of chemicals in the Ditch sediment.

25. Comment: How did you determine what is a reasonable risk with regard to human health?

Response: In order to determine what is a reasonable risk for human health, NJDEP followed USEPA guidelines. These guidelines included an acceptable exposure as having an excess carcinogenic risk in the range of one in ten thousand to one in one million ($1x10^{-4}$ to $1x10^{-6}$). After the RI/FS and Risk Assessment were performed for the PJP site, NJDEP adopted a new allowable cancer risk: one in one million ($1x10^{-6}$) based on P.L. 1993, c.139, Section 35d.

To assess non-carcinogenic effects, NJDEP follows USEPA's hazard index guidelines. A hazard index with a value greater than one is generally identified with potential adverse health effects. Details on the public health evaluation are provided in Section 5.0 of the Phase I RI.

26. Comment: NJDEP did not consider background conditions when evaluating potential risks presented by the site. Arsenic is used as an example of a naturally occurring inorganic that should not have been included in the assessment. Also, the proposed remedial action for the Sip Avenue Ditch is based on potential risks from non-site related contaminants.

Response: NJDEP believes that it is inappropriate to compare sediment concentrations from the Sip Avenue Ditch with the NJDEP Soil Cleanup Criteria to determine site-related contaminants of concern. The example of 20 parts per million for arsenic in soils considered to be "natural background" is not relevant to sediments in the Sip Avenue Ditch.

In the absence of native soils on site, it was unlikely that true background samples could be obtained at this urban, industrialized site. NJDEP decided to rely on a reference location at the upgradient-most portion of the Sip Avenue Ditch. It is not unreasonable to include contaminants of concern at background levels if they pose a risk. Also, it may be conservative to retain a chemical detected at low concentrations if it is a class A carcinogen, such as arsenic.

NJDEP acknowledges that the Sip Avenue Ditch does not originate on site and does provide a pathway for non-site related contaminants to enter the on-site portion of the Ditch. Nevertheless, NJDEP's ultimate decision to remediate the Sip Avenue Ditch was largely based on engineering principles associated with the modified solid waste cap

included in the selected remedy rather than solely human health and ecological risk concerns.

Also, please refer to response to comment No. 12.

27. Comment: The risk assessment concludes that excess risks warranting remedial action are present based on soil concentrations that are actually below NJDEP cleanup guidance.

Response: As shown in the Phase III FS, Table 1-3, numerous compounds were detected at concentrations exceeding NJDEP subsurface soil cleanup criteria.

28. Comment: The use of National Oceanographic Atmospheric Administration (NOAA) sediment screening guidelines to evaluate impacts to Sip Avenue Ditch is not appropriate, since no data were collected to assess benthic community presence/absence, structure or function, or to assess upgradient chemical conditions.

Response: The environmental assessment performed for the site (Phase I RI, Section 5.7) is considered to meet the standard practice for that time period. It was not then, nor is it now, standard practice to conduct benthic macroinvertebrate surveys as part of a baseline ecological risk assessment. Risk to ecological receptors from contaminated sediments is initially screened based upon comparison with NOAA sediment quality guidelines. Exceedances of these guidelines may suggest the potential for adverse ecological effects and thus may suggest the need for rigorous ecological investigations, such as benthic surveys.

29. Comment: The chemical sensitivity of resident benthic species is highly variable and may differ significantly from the organisms used in laboratory settings; selection of a remedy based upon laboratory bioassay results is not appropriate.

Response: NJDEP interpreted this comment to imply that the NOAA guidelines are based on laboratory bioassays and therefore are not appropriate for determining effects on in situ benthic species. In fact, the NOAA guidelines are based upon data from three basic approaches: the equilibrium-partitioning approach; the spiked-sediment bioassay approach; and, various methods of evaluating synoptically collected biological and chemical data in field surveys. NJDEP has always considered NOAA sediment quality guidelines, as well as other sediment quality guidelines generally available, as screening level values and are not intended to determine the need for a remedial action.

Also, please refer to response to Comment No. 12.

30. Comment: Since the upgradient sources of contaminants severely impact the Sip Avenue Ditch and Hackensack River, the area is not pristine and the evaluation of impacts to such a system requires information regarding baseline conditions for comparison.

Response: Please refer to the response to comment No. 26.

31. Comment: The application of NOAA sediment screening guidelines to Sip Avenue Ditch sediments is inappropriate because the criteria originate partly from data based on equilibrium partitioning coefficients, which do not address bioavailability of the compound or the organic carbon/acid volatile sulfide concentrations in sediment.

Response: The equilibrium partitioning approach to sediment quality evaluations does in fact address organic carbon content, since partitioning of a contaminant between sediments and interstitial water is dependent upon organic carbon content. The total organic carbon (TOC) is an integral part of the calculation for the sediment-specific criterion value and TOC content is directly related to bioavailability.

NJDEP and USEPA Region II do not endorse the routine use of acid volatile sulfide (AVS) to normalize sediment metals concentrations. NJDEP believes that much research is needed before this approach is widely applied. For example, additional data is needed to evaluate the use of AVS for oxidized sediments, where AVS concentrations can be low, invalidating the normalization of metals concentrations.

32. Comment: NOAA Effects Range-Low (ER-L) and Effects Range Median (ER-M) values are not to be construed as NOAA standards or criteria; exceedance of these values do not infer effects at a particular site.

Response: NJDEP's use of NOAA guidelines has always been for screening purposes. They have never been used or construed as remediation "standards."

Also, please refer to the response to comment 28.

33. Comment: Of the data presented, the mean sediment concentrations exceeded the NOAA ER-M for only four inorganics. It is inappropriate to use the NOAA "effects-based" values for

comparison to site data, since "effects" do not necessarily equate with mortality.

Response: Examination of Tables 4-8 and 4-10 in the Phase I RI indicate exceedances of the ER-L values for six inorganics and eight PAHs; the ER-M is exceeded for four inorganics. NJDEP and EPA Region II routinely consider both the ER-L and ER-M values, as well as any other appropriate State, Federal or literature values, in a "weight of evidence" approach when determining sediment quality. While it is true that "effects" do not equate with "mortality," we are certainly concerned with any sub-lethal effect (such as effects on reproduction, decreased growth, etc.) that could negatively impact the ecosystem.

34. Comment: Biological effects-based approaches--such as sediment bioassays, tissue residues-based methods, apparent effects thresholds approach, etc.--should have been used to derive threshold concentration limits for contaminants in sediments.

Response: Based on exceedance of NOAA guidelines, it is agreed that more rigorous evaluation of sediment toxicity could have been appropriate for studies subsequent to the Phase I RI. However, the need for remediation of the Sip Avenue Ditch was largely based on engineering principles associated with the modified solid waste cap included in the NJDEP selected remedy rather than solely human health and ecological risk concerns.

35. Comment: There are insufficient data to characterize Sip Avenue Ditch as an aquatic habitat, or that site-related constituents contribute to potential ecological risk. Past studies did not characterize presence/absence of a viable aquatic community nor did they use a biological effects-based approach for deriving threshold concentration limits; ammonia, hydrogen sulfide and dissolved oxygen should have been measured.

Response: Please refer to the response to comments 26 and 28-34. Also, ammonia, hydrogen sulfide and dissolved oxygen would normally be run as part of sediment bioassay testing, which was not done during this portion of the RI.

36. Comment: Based on the information in the Chronic BioMonitoring Report, a determination cannot be made about impacts to surface water and biota attributable to the site contrary to what is stated in the Proposed Plan. Specifically, the data set from November 1993 is inadequate to assess the ecological integrity of the current system nor are the data adequate to differentiate site-related contributors to degradation, if any.

Response: Please refer to the detailed response to comments 26 and 28-34.

37. Comment: Physical/chemical data, such as grain size, hydrogen sulfide in sediment, total organic carbon, dissolved oxygen, ammonia and temperature, should have been collected and used to conduct appropriate evaluation of the sediment and surface water data and bioassay results.

Response: NJDEP agrees that it would have been appropriate to measure the referenced conventional parameters and recommends their inclusion should any further testing be conducted. However, their omission has no impact on the remedial decision because the need for remediation of the Sip Avenue Ditch was largely based on engineering principles associated with the modified solid waste cap included in the NJDEP selected remedy rather than solely human health and ecological risk concerns. It should be noted that temperature, dissolved oxygen, pH, salinity and conductivity were measured by the laboratory conducting the bioassay on those samples, prior to test initiation. Those results are contained in the appendix to the Chronic BioMonitoring Report.

38. Comment: Inconsistencies between the analytical and bioassay results require that more information regarding test conditions be made available and presented with the data. It cannot be concluded that the cause of mortality was the test solution.

Response: NJDEP recognizes that the results of the bioassay tests are inconclusive. Based upon the contaminant levels measured in the river water, high mortality would not ordinarily be expected. Furthermore, the lowest mortality observed is associated with the highest chemical contamination, while the highest mortality observed is associated with the lowest contaminant levels. It is the experience of NJDEP's Site Remediation Program that these ostensible inconsistencies between bioassay and chemical data are not uncommon and, therefore, we have come to use a "weight of evidence" approach employing various environmental assessment methods when assessing ecological impacts from contaminated sites.

39. Comment: Relevant background references should have been identified in order to allow a comparison of the bioassay results associated with the site.

Response: Please refer to the response to comment 26.

40. Comment: The significant on-site risk identified as unacceptable in the Proposed Plan in not greater than the EPA acceptable risk range of 1×10^{-4} to 1×10^{-6}. Based on the Human Health Risk Assessment, there is no need to conduct a remedial response action addressing the Sip Avenue Ditch because the identified site risks are within the EPA's acceptable risk range.

Response: Normally, a baseline risk assessment evaluates the risk posed by the site in the absence of any remedial action. In the case of the PJP Landfill site, an IRM cap had already been put in place prior to evaluating site-wide risk. NJDEP decided that a residential exposure scenario (a house placed on top of the landfill with occupants eating the leachate and drinking contaminated water) was not realistic. Therefore, exposure was limited to children trespassing that included time spent playing in the Sip Avenue Ditch.

NJDEP acknowledges that the carcinogenic risk falls within EPA's acceptable risk range. However, a Hazard Index of 4 was calculated for current land use for the plausible maximum case of potential exposures and risk associated with incidental ingestion and dermal absorption by children of chemicals in sediment from Sip Avenue Ditch.

Also of relevance is EPA's Directive 9355 3-11FS dated July 1990 entitled "Streamlining the RI/FS for CERCLA Municipal Landfill Sites." Page three of this EPA Directive states, "Where established standards, for one or more contaminants in a given medium are clearly exceeded, the basis for taking remedial action can be established. Detailed, quantitative assessments that consider all chemicals, their potential additive effects, or additivity of multiple exposure pathways are not necessary to initiate remedial action." On page 389, section 5.9.3 of the Phase I RI, the comparison of site data to ARARs is discussed. Measured concentrations in soil, ground water and surface water exceeded these values.

Also, please refer to the response to comment No. 12.

41. Comment: There is no need to conduct a remedial response action addressing vented landfill gas because the identified site risks are all within or less than EPA's acceptable risk range of 10^{-4} to 10^{-6}.

Response: NJDEP acknowledges that the risk estimate for inhalation of vented landfill gas is within the EPA's acceptable risk range. However, NJDEP's ultimate decision to install a gas venting system is not a risk-based decision.

Also, please refer to the response to comment 59.

42. Comment: Risk estimates for carcinogenic PAHs are misrepresented based upon the summation for the class of chemicals versus evaluation of individual components.

Response: At the time the risk assessment was performed, it was the policy of both NJDEP and EPA Region II to treat all carcinogenic PAHs quantitatively with the same potency as Benzo(a)pyrene, while recognizing in the uncertainty section of the risk characterization that this approach may overestimate the true risk posed by the site.

43. Comment: The potential off-site risk is actually greater than risk estimates for the potential exposure to current on-site conditions.

Response: Comparing risk from anthropogenic background conditions off site to site-related risks are not relevant for determining remedial actions at NPL sites.

44. Comment: The risk assessment used the detection limit as the concentration present when a non-detect was indicated for inorganic chemicals in determining site-wide averages of the compounds.

Response: This was NJDEP policy at the time the risk assessment was done. Total risk from the Sip Avenue Ditch is $4x10^{-5}$, of which $3x10^{-5}$ is a result of carcinogenic PAHs.

45. Comment: The scope of the remedy as it pertains to the Sip Avenue Ditch is inconsistent with the potential risk determined by NJDEP and supported by site engineering data.

Response: Please refer to the response to comment 12.

46. Comment: The Human Health Risk Assessment used extrapolated emission concentrations at estimated maximum discharge rates when evaluating risks that are overly conservative. The non-methane organic compound should have been quantified on a weight/time basis with results reported in pounds per eight hours. NJDEP should have used EPA Method 25C to analyze landfill vent gases rather than EPA Method TO-14.

Response: Table 5-18 of the Phase I RI lists a summary of estimated ambient air concentrations for the site for both the geometric mean and maximum air concentrations. It would be inappropriate to use results reported on an eight-hour basis for nearby residents. Not using a time-weighted approach for the trespasser and worker would probably overestimate site-

related risks. However, site risks are already less than $1x10^{-6}$ for all scenarios except the Plausible Maximum Case for the child trespasser, which is $2x10^{-6}$, a level EPA deems discretionary for taking remedial action. Finally, EPA Method 25C was not developed until 1991, so it was not feasible to use this methodology for the site RI completed prior to 1991.

47. Comment: A reference was made to a statement in the Phase III FS prepared by NJDEP's contractor ICF Technology Company that "there were no contaminants found in the surface soil sampling data in exceedance of the current NJDEP non-residential surface soil cleanup criteria; and there were no contaminants found in the subsurface soil sampling data in exceedance of the current subsurface soil cleanup criteria."

Response: Further scrutiny of the FS report indicates that the ICF statements are erroneous. In order to correctly evaluate the data, it is necessary to review the RI and Proposed Plan. The RI data tables depict that contaminants were detected in surface, subsurface and test pit soil samples at concentrations greater than NJDEP's surface and subsurface soil cleanup criteria in use at the time the RI/FS was performed. Please note that the current soil cleanup criteria categories are different from those used during the RI/FS. Presently, DEP's soil cleanup criteria is listed under the categories of residential direct contact, non-residential direct contact and impact to ground water.

48. Comment: The cost of the NJDEP proposed solid waste cap is not justified based on risk assessments:

Response: Please refer to the response to comments No. 26 and 40.

VIII. Wetlands

49. Comment: It is a presumption in the Proposed Plan that wetland mitigation/land banking will be required as part of the remediation of the site. A functional wetland evaluation should have been conducted at the site prior to determining if, and what types of, compensatory measures are required.

Response: While NJDEP implies in Section XIII of the Proposed Plan that a mitigation plan to address areas impacted will be prepared, it is also stated that the design phase will include a wetland assessment. In Section XIII of the Proposed Plan NJDEP states that "a qualitative assessment of the habitat values, acreage,

tidal influences and other defining factors will characterize the wetlands and better provide requirements for the restoration of any wetlands found to be impacted." Thus, wetlands are appropriately considered in the remedial design/action phases. During further wetland characterization and compensatory decisions, NJDEP will use "Considering Wetlands at CERCLA Sites" (EPA540/R-94/019, May 1994) as a guide.

50. Comment: NJDEP did not evaluate the existing wetlands or perform a species inventory.

Response: This statement appears erroneous because it does not take into account work performed during the RI. Specifically, work performed during the RI, as noted in Section 5.0 of the Phase I RI, includes identifying wetlands, conducting a vegetation inventory, and listing expected terrestrial wildlife and aquatic species and observed wildlife.

IX. IRM/Fires

51. Comment: In the late 1980's underground fires occurred in an area defined as Lincoln Park West. Additionally, there have been other underground fires in that area as late as a couple of years ago. What studies have been done to see what effects the PJP Landfill has had on this area? Can DEP require that additional testing be done in that area?

Response: Historical information indicates that underground fires did occur in 1986 in the Lincoln Park West area, which is near the PJP Landfill site. These fires were extinguished in 1986 by Boots and Coots, the same NJDEP contractor responsible for extinguishing the fires at the PJP Landfill site. The PJP Landfill site and the Lincoln Park West area are separated by roads and other paved surfaces. There is no connection between the fires at the two sites. Local officials can request that NJDEP conduct a preliminary assessment and site investigation of the Lincoln Park West area as a separate action.

52. Comment: What kind of cap was used during the IRM?

Response: A two-foot cap was installed by NJDEP during the IRM. A cross section of the IRM cap consists of the following sections: six inches of clean fill material (bottom layer); 12 inches of

clay (middle layer); and, six inches of topsoil that was hydroseeded (top layer).

53. Comment: How can you guarantee the fire will not flare up again?

Response: NJDEP took all possible steps during the IRM to prevent a fire from reoccurring. These included: removing hazardous materials that fueled the fire; excavating and dousing the fill to the water table; and, compacting and capping the fill to prevent it from reigniting.

X. NJDEP Preferred Remedy

54. Comment: The NJDEP proposed Solid Waste Cap design for the PJP Landfill is not in compliance with the most current NJDEP Bureau of Landfill Engineering guidance. The NJDEP has not followed its own guidance.

Response: NJDEP's proposed cap for the site is a modified solid waste cap. It should be noted that at the present time NJDEP's "Technical Guidance for Final Covers at Sanitary Landfills" is guidance, not a promulgated regulation.

55. Comment: The NJDEP proposed solid waste cap may prove to be an ineffective "barrier" to prevent precipitation infiltration.

Response: NJDEP's proposed cap for the site incorporates USEPA guidance that called for a cap with a 10^{-7} impermeability to ensure adequate impermeability for the site.

56. Comment: The NJDEP proposed impervious modified Solid Waste Cap will inhibit expedient natural attenuation since it does not account for the hydrological setting of the landfill medium. A more "pervious" cover would be more beneficial.

Response: Due to the nature of the waste in the uncapped portions of the site, it is necessary to install an impervious cap.

57. Comment: The NJDEP proposed 3.5 foot thick Solid Waste Cap may adversely impact the existing structures in the area.

Response: Please refer to the response to comment No. 16.

58. Comment: The NJDEP proposed modified solid waste cap with a high density polyethylene (plastic) and/or clay layer will inhibit development in the area.

Response: NJDEP will work with interested parties to allow for reuse of the site.

Also, please refer to the response to comment No. 15.

59. Comment: The NJDEP Proposed Plan is inconsistent with respect to landfill gas management. An active gas collection system was eliminated from consideration while a gas treatment system was retained in the Phase I and II feasibility study, which is contradictory because you need a collection system if you have a gas treatment unit. The Proposed Plan should reflect gas management by monitoring or appropriate actions should be determined during the design phase. Also, gas management would be better served by the use of a "pervious" cover.

Response: As with all major landfill closures, a gas venting or treatment system needs to be included in the permanent remedial actions selected for the PJP site. A gas venting system is operating on the portion of the site capped during the IRM. Furthermore, a collection trench and venting system will be included for the remainder of the site to be capped with the possibility that this system will be upgraded to an active system during the design phase. If an active system is determined to be necessary, the IRM cap venting system will be incorporated into the new active treatment system.

Overall, the reasons for installing a gas venting system are regulatory and engineering based, in accordance with NJDEP solid waste guidance. A system is needed to control the pressure and migration of landfill gases under the proposed cap. The specific type of venting system--passive or active--will be determined during the design phase.

60. Comment: The PJP PRP Group submitted an alternate cap design that it states is equally protective--meeting or exceeding the expected performance of NJDEP's proposed remedy--and much more cost efficient.

Response: The ROD permits a degree of flexibility in the design of the cap, so long as the alternate design meets the ROD's requirements, e.g. an impermeability of 10^{-7} and other stated engineering controls.

61. Comment: Why did NJDEP not evaluate in the feasibility study a cap similar to the one the agency used as an IRM cap in 1985 for a 45-acre portion of the site since NJDEP has since determined

that the IRM cap to be a sufficient permanent remedy for this portion of the site.

Response: The IRM cap was part of an interim action. Prior to the IRM cap installation, NJDEP removed 4,770 intact drums, 4,600 cubic yards of contaminated soil (including 650 cubic yards of soil contaminated with polychlorinated biphenyls), 136 pressurized gas cylinders and other contaminated debris. Also, during the interim action approximately 1,033,000 cubic yards of refuse were excavated and compacted.

62. Comment: Is this project the direct responsibility of NJDEP?

Response: NJDEP is the lead agency for this Superfund site. USEPA provides oversight with respect to review of the RI/FS and ROD. NJDEP will sign the Declaration Statement for the ROD with concurrence from USEPA.

63. Comment: Where would you take the known contaminated areas that are removed?

Response: Areas of contamination removed during the remediation will be analyzed and disposed of at an appropriately licensed disposal facility.

Index of Attachments

A. Proposed Plan
B. Public Meeting Notice
C. Public Meeting Transcript
D. Written Comments

Proposed Plan

PJP Landfill Superfund Site

Jersey City, Hudson County **August 18, 1994**

I. PURPOSE OF PROPOSED PLAN

This Proposed Plan describes the remedial alternatives considered for the PJP Landfill Superfund Site (the Site) and identifies the preferred remedial alternative along with the rationale for this preference. The Proposed Plan was developed by the New Jersey Department of Environmental Protection (NJDEP), as lead agency, with support from the U.S. Environmental Protection Agency (EPA). NJDEP is issuing the Proposed Plan as part of its public participation responsibilities under Section 117(a) of the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) of 1980, as amended, and Section 300.430(f) of the National Contingency Plan (NCP). The alternatives summarized here are described in the Remedial Investigation and Feasibility Study (RI/FS) report which should be consulted for a more detailed description of all the alternatives.

This Proposed Plan is being provided as a supplement to the RI/FS report to inform the public of NJDEP's and EPA's preferred remedy and to solicit public comments pertaining to all the remedial alternatives evaluated, as well as the preferred alternative.

The remedy described in the Proposed Plan is the preferred remedy for the Site. Changes to the preferred remedy or a change from the preferred remedy to another remedy may be made, if public comments or additional data indicate that such a change will result in a more appropriate remedial action. The final decision regarding the selected remedy will be made after NJDEP and EPA have taken into consideration all public comments. We are soliciting public comment on all of the alternatives considered in the detailed analysis of the RI/FS because NJDEP and EPA may select a remedy other than the preferred remedy.

II. COMMUNITY ROLE IN THE SELECTION PROCESS

EPA and NJDEP rely on public input to ensure that the concerns of the community are considered in selecting an effective remedy for each Superfund site. To this end, the RI/FS reports, Proposed Plan, and supporting documentation have been made available to the public for a public comment period which begins on August 2, 1994 and concludes on August 31, 1994.

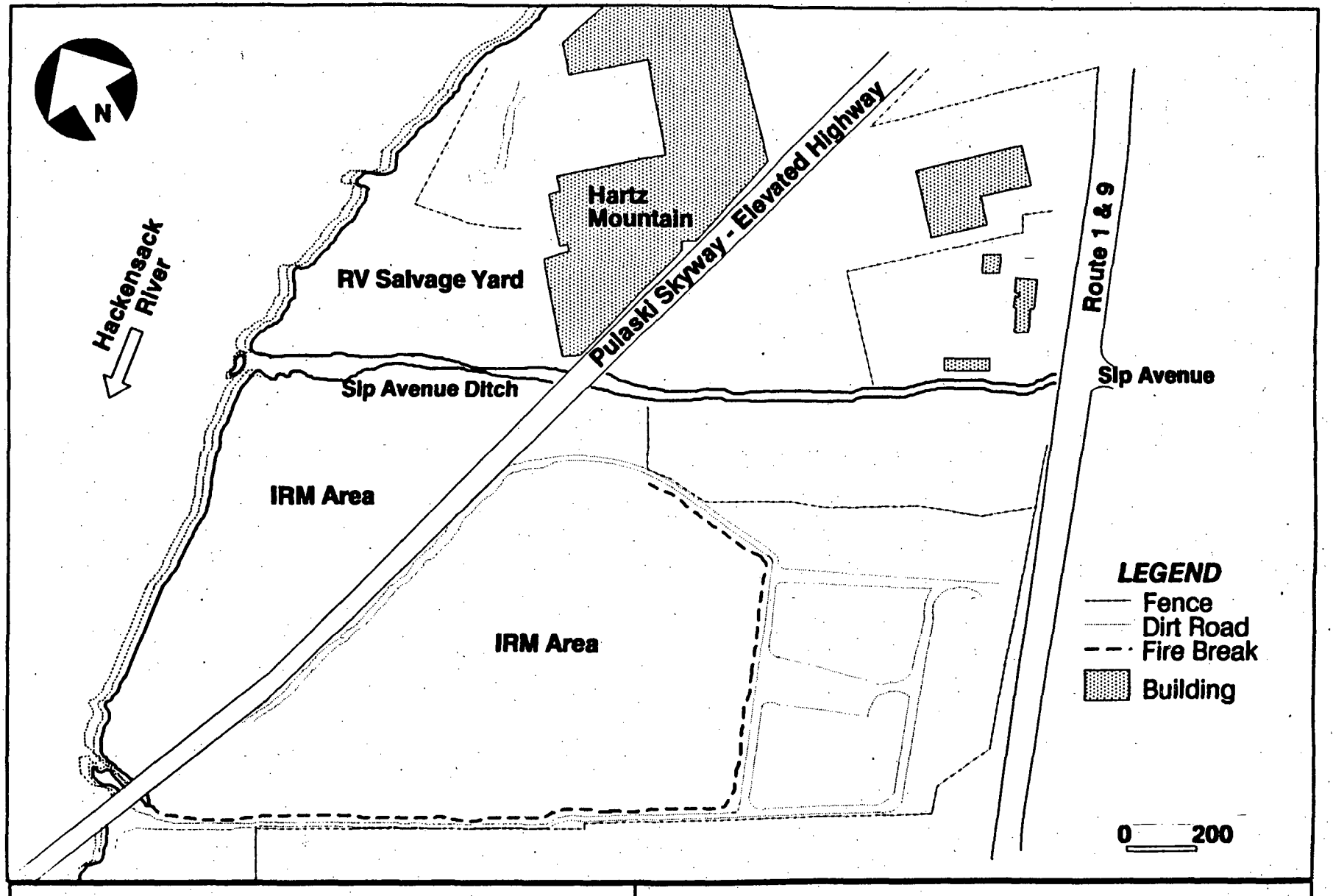
A public meeting will be held during the public comment period at the Jersey City Municipal Building on Thursday, August 18, 1994 at 7:00 PM to present the results of the RI/FS reports, to elaborate further on the reasons for recommending the preferred remedial alternative, and to receive public comments.

Comments received at the public meeting, as well as written comments received before or after the meeting, will be documented in the Responsiveness Summary section of the Record of Decision (ROD), the document which formalizes the selection of the remedy. All written comments should be addressed to:

Donald J. Kakas, Acting Chief
Bureau of Community Relations
Site Remediation Program
Department of Environmental Protection
CN 413
Trenton, NJ 08625-0413

Dates to Remember
August 2, 1994 through September 30, 1994
Public Comment Period

Thursday, August 18, 1994 at 7 p.m.
Public Meeting at the Jersey City Municipal Building
280 Grove Street
Jersey City, New Jersey



Site Map

PJP LANDFILL, JERSEY CITY, NEW JERSEY

III. Administrative Record File Locations

The Administrative Record File contains the information upon which the selected response action will be based. The Administrative Record File, assembled to date, is available at the following locations:

New Jersey Department of Environmental Protection
401 East State Street
Trenton, NJ 08625-0413
Phone (609) 984-3081

Copies of the RI/FS reports, Proposed Plan, and supporting documentation are also available at the following locations:

Jersey City Public Library
472 Jersey Avenue
Jersey City, NJ 07302
(201) 547-4516

Jersey City Municipal Building
Engineering Division
280 Grove Street
Jersey City, NJ 07302
(201) 547-6852

IV. SITE BACKGROUND

The Site occupies approximately 87 acres in Jersey City, Hudson County, New Jersey. The Site is bordered on the north and west by the Hackensack River and on the east by Truck Routes 1 and 9. The Site extends northeast towards Hackensack Avenue and Broadway Avenue. A truck stop, a recycling facility and a warehouse are also located in this area. Multiple dwelling housing units are located northeast and southeast of the Site. The Pulaski Skyway, an elevated highway, passes over the Site. The Sip Avenue Ditch bisects the Site and conveys run-off from the PJP Landfill and Jersey City storm water/ sewer into the Hackensack River.

The Site was originally a salt meadow, a portion of which was condemned in 1932 for the construction of the Pulaski Skyway. The PJP Landfill Company operated a commercial landfill at the Site, accepting chemical and industrial waste from approximately 1968 to 1974.

From 1970 to 1985, subsurface fires which were attributed to spontaneous combustion of subsurface drums and decomposition of landfill materials, frequently burned at a 45-acre portion of the PJP Landfill and emitted large amounts of smoke. In 1977, the NJDEP issued an order to the PJP Landfill Company to properly cover and grade the landfill, and to remove wastes in contact with the Hackensack River and the Sip Avenue Ditch. The PJP Landfill Company did not comply with the order.

Throughout the early 1980s, NJDEP and the Hudson Regional Health Commission inspected the Site and conducted sampling and air monitoring. In December 1982, the Site was included on the EPA's National Priorities List (NPL), which identifies hazardous waste sites that pose a significant threat to public health or the environment.

During 1985 and 1986, NJDEP conducted an Interim Remedial Measure (IRM) to extinguish the fires and cap the 45 acre area. The IRM resulted in the extinguishing of fires; excavation and recompaction of 1,033,000 cubic yards of material; and the removal of grossly contaminated soils, cylinders and drums containing hazardous materials on approximately 45 of the 87 acres. These hazardous materials were properly disposed of off site at secure landfills or hazardous waste incinerators. A fire break trench was installed and the 45 acre area was regraded, capped and seeded. A gas venting system was also installed on the 45-acre portion of the landfill. All subsurface fires have been out since the completion of the IRM in May 1986.

The NJDEP contracted ICF Technology, Inc. (ICF) in 1988 to perform an RI/FS on the entire 87 acres of the landfill. A Phase I RI was completed by ICF in 1990. The RI identified areas and levels of contamination at the Site. The study included a geographical investigation and a shock-sensitive drum investigation to determine the density and condition of buried drums, extent of landfill material, the shock sensitivity of drums, and drum markings. An FS was also performed, which developed and evaluated various remedial alternatives for addressing Site contamination.

In the summer of 1993, NJDEP implemented a plan to assist in the evaluation of the current impact the site was having on the adjacent Hackensack River and on the deeper aquifer of concern beneath the fill

material. The sampling effort consisted of the sampling of three shallow and three deep monitoring wells, and six surface water and sediment locations. In addition, a series of bioassays at the sediment sample locations and in the waters of the two wells with the highest levels of contamination was performed.

V. REMEDIAL INVESTIGATION SUMMARY

The purpose of the RI was to: 1) determine the nature and extent of contamination resulting from historic Site activities; 2) identify potential contaminant migration routes; 3) identify potential receptors of Site contaminants; 4) characterize potential human health risks and related environmental impacts; and 5) evaluate the current impacts, if any, the Site may have on the adjacent Hackensack River.

During the RI, surface and subsurface soil boring samples, excluding the capped area surface, were taken from the Site. The RI identified contaminants above NJDEP proposed health based soil cleanup criteria in surface soils, subsurface soils (excluding test pits) and test pits. The soil cleanup criteria, although not promulgated, is currently used in lieu of standards.

Arsenic was detected in the surface soils samples in concentrations greater than the proposed soil cleanup criteria of 20 parts per million (ppm). In the subsurface soils (excluding the test pits which are discussed later in the Proposed Plan), the following contaminants were detected at levels exceeding the cleanup criteria: Benzene (maximum concentration detected 1.6 ppm), bis(2-ethylhexyl)phthalate (maximum concentration detected 180 ppm) and chlorobenzene (maximum concentration detected 2.92 ppm).

Chemicals were detected more frequently, and in higher concentrations, in the test pits than were detected in samples from other media. Bis(2-ethylhexyl)phthalate (maximum concentration detected 33,100 ppm) and petroleum hydrocarbons were the predominant organic chemicals found in the subsurface soils of those that exceed the proposed soil cleanup criteria. Other predominant organic chemicals detected in the soils sampled from the test pits that exceed the NJDEP proposed impact to ground water soil cleanup criteria are the following: benzene (maximum concentration detected 250 ppm), dieldrin (maximum concentration detected 200 ppm), tetrachloroethene (maximum concentration detected 41 ppm), and total xylenes (maximum concentrations detected 3900 ppm). Carcinogenic and non-carcinogenic polycyclic aromatic hydrocarbons (PAHs) and inorganic chemicals (metals) were also detected frequently in the subsurface soils.

The Sip Avenue Ditch sediment samples were compared to the National Oceanographic and Atmospheric Administration (NOAA) sediment screening criteria. This guidance sets criteria for contaminants which may have potentially harmful biological effects to aquatic life. Sediment contaminants were found in the Sip Avenue Ditch exceeding this screening criteria. The highest concentrations found were total PAH (14.8 ppm for carcinogenic PAH; 30.1 ppm for noncarcinogenic PAH), antimony (93.6 ppm), cadmium (6.3 ppm), chromium (771 ppm), copper (34,000 ppm), lead (406 ppm), mercury (5.1 ppm), nickel (1,260 ppm), and zinc (9,830 ppm).

Landfill gas vent sample data obtained during the Remedial Investigation was used to approximate the total amount of contaminants discharged from the gas vent system in terms of pounds per hour. Eight of the forty-nine existing vents were sampled on three separate occasions, and used as representative vents for the entire system. The maximum flow rate from the forty-nine vents was used to calculate potential discharges (8.73 cubic feet per minute/cfm) and the maximum contaminant concentrations from the three sample rounds was used for each contaminant.

Discharge numbers were calculated for total emissions and toxic emissions. Using the average and maximum contaminant concentrations for the eight landfill gas vents, typical landfill emissions and the worst case scenario emissions were determined. The total emissions average of .43 lbs/hr, and maximum of 1.5 lbs/hr, respectively, are within the acceptable/allowable limit of 1.5 lbs/hr. The toxic emissions average of .07 lbs/hr is also within the acceptable/allowable limit of .1 lbs/hr while the toxic emissions maximum of .27 lbs/hr is above the acceptable/allowable limit of .1 lbs/hr.

The NJDEP 1993 sampling effort revealed the following:

The monitor well analyses indicated that only 11 compounds were detected in the three (3) wells at levels slightly above New Jersey Surface Water Quality Standards. Hackensack River water and sediment samples were collected upstream and downstream of the site. These samples indicated the presence of VOC's, Semi-VOC's, pesticides/PCB's and Inorganics.

Contamination is also present in the Sip Ave ditch, both adjacent to Routes 1 & 9 and at the confluence of the ditch with the river. For the river water and ditch water samples, the highest levels of contamination were found in the Sip Ave ditch adjacent to Routes 1 & 9. The fact that contamination was detected both upstream and downstream in the Hackensack suggests that there may be multiple sources of contamination.

All four (4) of the bioassay sampling locations in the river, including the upstream location, and the two wells showed significant mortality. This data indicates that potential adverse impacts on biota by these contaminated waters is likely occurring.

The results of the Bedrock Aquifer Well sampling indicate that all three of these wells are below New Jersey Ground Water Quality Standards. The sampling results indicate that none of the contaminants found in the wells exceed NJDEP's Ground Water Quality Standards for Volatile Organics, Semi-Volatile Organics, and Pesticides.

VI. SUMMARY OF SITE RISK

Based upon the results of the RI, a baseline risk assessment was conducted to estimate the risk associated with the current and future Site conditions. The Baseline Risk Assessment estimates the human health and ecological risk which could result from the contamination at the Site if no remedial action were taken. The analysis assists in evaluating whether remediation is necessary.

Human Health Risk Assessment

A four step process is utilized for assessing site-related human health risks for a reasonable maximum exposure scenario: ***Hazard Identification*** - identifies the contaminants of concern at the Site based on several factors such as toxicity, frequency of occurrence, and concentration; ***Exposure Assessment*** - estimates the magnitude of actual and/or potential human exposures, the frequency and duration of these exposures, and the pathways by which humans are potentially exposed (e.g., ingesting contaminated soil/water); ***Toxicity Assessment*** - determines the types of adverse health effects associated with chemical exposures, and the relationship between magnitude of exposure (dose) and severity of adverse effects (response); and ***Risk Characterization*** - summarizes the combined output of the exposure and toxicity assessments to provide a quantitative (e.g., one -in-a-million excess cancer risk) assessment of site-related risks.

The Baseline Risk Assessment evaluated site-specific exposure scenarios that represent potential situations in which humans may be exposed to contaminants originating from the Site. Several scenarios, or exposure pathways, were selected for evaluation under both current and future land-use conditions. The risk assessment determined that the greatest risks associated with the Site under current conditions are: the incidental ingestion and dermal absorption of chemicals in sediment by trespassing children wading in the Sip Avenue Ditch; and the inhalation of chemicals that have been released from landfill gas vents by trespassing children, nearby workers, and nearby residents.

For carcinogens, risk is represented in terms of an individual's likelihood of developing cancer as a result of exposure to a carcinogenic chemical present in the exposure media (e.g., soil, sediment). The results of the Baseline Risk Assessment indicated that several exposure pathways pose an unacceptable risk to human health under current land-use conditions, with the greatest calculated risk from incidental ingestion and dermal absorption of chemicals in sediment by trespassing children wading in the Sip Avenue Ditch. The carcinogenic risk for children was estimated to be 4x10-5. The risk number means that four additional children out of one hundred thousand are at risk of developing cancer if the Sip Avenue Ditch sediment is ingested. Current federal guidelines for acceptable exposure are an excess carcinogenic risk in the range of 10-4 to 10-6 (one in ten thousand to one in one million). Where the calculated lifetime excess cancer risk is below 1x10-4, no remedial action is generally required under EPA guidelines.

To assess the overall potential for noncarcinogenic effects (e.g., toxicity) posed, EPA developed the Hazard Index (HI). This index measures the assumed simultaneous exposures to chemicals which

could result in adverse health effects. An HI greater than one (1) is generally identified with potential adverse health effects. For incidental ingestion/ dermal absorption of Sip Avenue Ditch sediments the HI was calculated to be four (4).

In addition to ingestion/dermal absorption of Sip Avenue Ditch sediments, other exposure pathways were found to exceed EPA's carcinogenic target risk range of 10-4 to 10-6 and to present human health risks under current land-use conditions. These included inhalation of chemicals released from landfill gas vents by trespassing children, nearby workers, and nearby residents. However, the HIs for these exposure pathways are less than one (1).

A qualitative risk assessment was performed for future land-use conditions. Although not likely, it is possible that land use at the Site could change in the future, resulting in additional exposure pathways that do not exist under current land-use conditions. The most plausible land-use change would be development of the landfill area as an industrial/commercial area. If the area were developed, on-site construction workers could be exposed via direct contact with contaminated sediments, subsurface soil, and materials in test pits, or air. Generally, the concentrations of chemicals detected in test pits and subsurface soils are substantially higher than in sediments. Therefore, future workers exposed to these subsurface contaminants could be at significant risk. Inhalation exposures are estimated to be approximately equal to those estimated for trespassing children. For long-term exposures, this risk would probably be greater than the 10-4 to 10-6 range. Future workers could also be exposed to chemicals released from landfill gas vents.

VII. ENVIRONMENTAL ASSESSMENT

The Environmental Assessment provides a qualitative evaluation of the actual or potential impacts associated with the Site on plants and animals (other than people or domesticated species). The primary objectives of this assessment were to identify the ecosystems, habitats, and populations likely to be found at the Site and to characterize the contaminants, exposure routes and potential impacts on the identified environmental components. Although the Environmental Assessment identified several endangered species and sensitive habitats in the vicinity of the Site, it concluded that chemical contamination from the Site is not expected to have significant impacts on plants or terrestrial wildlife, but may be impacting aquatic life.

The environmental assessment is summarized as follows:

- Some wetlands exist at the Site but were created due to previous landfilling activities. While wetland and upland plant species can be exposed to chemicals in surface soil, chemical-related impacts in plants are not expected to be significant and are most likely limited to contamination source areas (e.g., the drum disposal area).

- The Site is within the current or historical range of several State endangered or threatened species that inhabit coastal areas and/or marshes. Poten tial impacts associated with ingestion of surface water from the Sip Avenue Ditch are not expected to be significant because use of this surface water as a drinking water source by terrestrial wildlife at the Site is expected to be limited; most of the species that use the Site are likely to obtain water from their diet or from smaller surface water areas. In addition, potential impacts associated with exposure to chemicals that have accumulated in the food chain are not expected to be significant.

- Sediment concentrations for several chemicals in the Sip Avenue Ditch exceeded their respective toxicity values, suggesting that adverse impacts on aquatic life may be occurring at the Site.

VIII. SCOPE AND ROLE OF ACTIONS

The problems at the Site are complex, necessitating a phased approach for addressing site-related problems. This Proposed Plan will address cleanup remedies for the Sip Avenue Ditch sediment, air and landfilled material which includes areas of buried drums and surrounding contaminated soil. A monitoring program will be established to determine whether additional actions may be necessary to mitigate the leaching of contaminants to ground water and surface water as well as to the Hackensack River.

IX. REMEDIAL ACTION OBJECTIVES

Remedial Action Objectives are specific goals to protect human health and the environment. These objectives are based on available information, applicable or relevant and appropriate requirements (ARARs), and risk-based levels established in the risk assessment. The following remedial action objectives were established for cleanup activities at the Site:

-Prevent direct contact with the contaminated sediments in the Sip Avenue Ditch.

-Prevent additional contaminant influx into the ground water via infiltration of rain water.

-Mitigate the release of hazardous substances into air via gaseous emissions.

-Evaluate if future actions are necessary to mitigate the leaching of Site contaminants into the Hackensack River through the monitoring and modeling of potential im pacts of leachate and ground water from the Site on the Hackensack River over time.

-Removal of contaminant sources that may impact ground water.

X. SUMMARY OF ALTERNATIVES

CERCLA requires that each selected Site remedy be protective of human health and the environment, be cost-effective, comply with other statutory laws, and utilize permanent solutions and alternative treatment technologies and resource recovery alternatives to the maximum extent practicable. In addition, the statute includes a preference for the use of treatment as a principle element for the reduction of toxicity, mobility, or volume of the hazardous substances.

The FS evaluates in detail several remedial alternatives for addressing the contamination associated with the first operable unit. These alternatives are:

Alternative LF-1: No Action
Alternative LF-2: Minimal Action
Alternative LF-3: Soil Cover
Alternative LF-4: NJDEP Solid Waste Cap (Extending Existing Cap)
Alternative LF-5: NJDEP Hazardous Waste Cap
Alternative LF-6: RCRA Hazardous Waste Cap - Incorporating Existing Cap
Alternative LF-7: New RCRA Hazardous Waste Cap

The following two options are applicable to Alternatives LF-3 through LF-7:

OPTION 1:	No Drum Removal
OPTION 2:	Drum Removal (All Known and Suspected Buried Drum Areas and Associated Soils)

For Alternatives LF-3 through LF-7 the SIP Avenue Ditch will be replaced with an alternative form of drainage, in order to prevent direct contact with the contaminated sediments. Design details related to the Sip Avenue Ditch will be resolved in the remedial design phase of the Project. The remedial design will also include a wetlands assessment to determine what wetlands were impacted or disturbed by contamination and a wetlands restoration plan to mitigate those areas found to have been impacted.

For Alternatives LF-3 through LF-7 the Design Phase will include a delineation of the extent of the area to be capped, up to the physical boundaries created by the building structures previously described in the Site background.

Under Alternatives LF-2, LF-3, and LF-4, the existing landfill gas venting system will be sampled during the design phase to determine compliance with current State and Federal air quality standards. If at that time air emissions are not in compliance with the accepted maximum limits for Total Volatile Organics, the appropriate measures will be incorporated into the design phase to bring the Site into compliance with air requirements.

For Alternatives LF-5, LF-6, and LF-7, the design phase will include a new landfill gas venting system that will be designed (active vs. passive) to comply (including treatment, if necessary) with State and Federal air quality standards.

This Proposed Plan presents alternatives, which are described in greater detail below. Implementation times given include the time necessary to construct and implement the remedy but do not include the

time required for design or award a contract for the performance of the work.

ALTERNATIVE LF-1: NO ACTION

Estimated Capital Cost:	None
Annual Operation and Maintenance:	None
Estimated Present Worth:	None
Estimated Implementation Time:	None

The National Oil and Hazardous Substances Pollution Contingency Plan (NCP) and CERCLA require the evaluation of a No Action alternative to serve as a point of comparison with other remedial action alternatives. Under this alternative, no action would be taken to contain, treat, or control the contamination at the Site. The subsurface soil contamination would decrease over a long period of time through natural processes such as flushing and attenuation. This alternative does not include any measures to restrict access to the Site. Essentially, the Site would remain the same as it is today.

ALTERNATIVE LF-2: MINIMAL ACTION

Estimated Capital Cost:	$209,000
Annual Operation and Maintenance:	$105,000
Estimated Present Worth:	$752,000
Estimated Implementation Time:	None

Under this alternative, no remedial action would be performed at the Site to contain, treat, or control the contamination at the Site. However, institutional controls, such as deed restrictions to restrict future use of the Site and public information programs to increase public awareness of potential problems associated with the Site, would be implemented. In addition, although most of the Site is already fenced, the existing fence would be extended to restrict access and reduce the potential for direct exposure to sediment contamination. Long-term monitoring of soil, sediment and air quality would be performed for a minimum of five years to evaluate the migration of contaminants from the Site and to monitor the effects of natural attenuation.

A Site review would be instituted at the end of five years in order to reevaluate Site conditions. This includes an evaluation of what additional measures, if any, should be implemented based on the Site conditions.

ALTERNATIVE LF-3: SOIL COVER

Estimated Capital Cost:	$16,368,000
Annual Operation and Maintenance:	$291,000
Estimated Present Worth:	$17,716,000
Estimated Implementation Time:	6 months

As described earlier, a 45-acre portion of the landfill was already partially excavated and capped with one foot of clay and one foot of soil during the completion of the IRM in 1986. Under this alternative, a two foot soil cover would be installed over the remaining, uncapped landfill area, which will be determined in design. The proposed soil cover design includes installation of a top soil layer over the uncapped area and vegetation to prevent soil erosion. Existing gas vents would be sampled and analyzed annually to monitor the gas releases to the atmosphere from the Site. If the gas poses a threat, treatment options would be developed and implemented. In addition, institutional controls and site fencing would be implemented as described for Alternative LF-2 above.

The soil covered area would require quarterly inspections and maintenance, and a review and reevaluation of Site conditions after five years.

ALTERNATIVE LF-4: NJDEP SOLID WASTE CAP (Extending Existing Cap)

Estimated Capital Cost:	$22,022,000
Annual Operation and Maintenance:	$369,000
Estimated Present Worth:	$23,707,000
Estimated Implementation Time:	1.5 years

As described earlier, a 45-acre portion of the landfill was already partially excavated and capped with one foot of clay and one foot of soil during the IRM. Under this alternative, the remaining landfill area, which will be determined in design, would be capped with a multi-layer, solid waste cap in accordance with NJDEP Bureau of Landfill Engineering guidance and New Jersey Solid Waste Regulations regarding closure and post closure requirements for solid waste landfills. The solid waste cap would combine several layers of cover materials, such as clean sand, soil and impervious layer such as a High Density Polyethylene (plastic) or clay liner to contain the contaminated solids. It would also include a top soil layer and vegetation to prevent soil erosion. The total thickness of the entire cap system would be approximately 3.5 feet. The existing gravel lined ditch along the southern border of the capped

portion of the landfill would be incorporated into the design of surface water run-off controls.

The use of a passive or active gas venting system would be determined during the remedial design phase of the project. Periodic inspections of the cover installed during the IRM will be performed before and during the implementation of the remedial action. If the cap is damaged or degraded, then at least one additional foot of topsoil will be spread over the previously installed cap. Ground water would be monitored quarterly to evaluate the reduction of contaminant concentrations and determine if natural attenuation is occurring at the Site. The Site would be reviewed at the end of five years in order to reevaluate Site conditions. The review would include an analysis of the surface and ground water monitoring data, which would be used in a ground water model aimed at evaluating what, if any, impact ground water or leachate is having on the Hackensack River. The review will also include an assessment of current residual health risks, an evaluation of the effectiveness of the Site fencing to control access, and an evaluation of what additional remedial measures, if any, should be implemented based on the reviewed Site conditions.

ALTERNATIVE LF-5: NJDEP HAZARDOUS WASTE LANDFILL CAP

Estimated Capital Cost:	$35,029,000
Annual Operation and Maintenance:	$369,000
Estimated Present Worth:	$36,714,000
Estimated Implementation Time:	3 years

As described earlier, a 45-acre portion of the landfill was already partially excavated and capped with one foot of clay and one foot of soil during the completion of the IRM. Under this alternative, the existing 45-acre cap would be left in place and a new multi-layer cap would be placed over the entire landfill area. The new cap would comply with the New Jersey Hazardous Waste Regulation (N.J.A.C. 7:26-10.8(i)) regarding closure and post closure requirements for hazardous waste landfills. The proposed cap would consist of a vegetative top soil cover, a sand drainage layer, a bedding layer and a liner system constructed of two synthetic liners. The total thickness of the entire cap system would be approximately 6 feet. The existing gravel-lined ditch would be incorporated in the design to aide with the collection of surface water run-off.

In addition, institutional controls and Site fencing would be implemented as described for Alternative LF-2 above. Regular monitoring and a five year review would also be required as described for Alternative LF-4 above.

ALTERNATIVE LF-6: RCRA HAZARDOUS WASTE CAP (INCORPORATING EXISTING CAP)

Estimated Capitol Cost:	$44,226,000
Annual Operation and Maintenance:	$369,000
Estimated Present Worth:	$45,911,000
Estimated Implementation Time:	3 years

As described earlier, a 45-acre portion of the landfill was already partially excavated and capped with one foot of clay and one foot of soil during the completion of the IRM. Under this alternative, the existing cap would be upgraded and incorporated into a Resource Conservation and Recovery Act (RCRA) cap, which would be installed over the remaining landfill area, which will be determined in design. The RCRA cap is a multi-layer cap that combines several layers of cover materials such as soil, synthetic membranes, and clay to provide erosion and moisture control, in addition to containing the contaminated solids. The entire Site would be graded for proper drainage and seeded with grass for erosion control. The total thickness of the entire cap system would be approximately six feet. The existing gravel-lined ditch would be incorporated in the design to aide in the collection of surface water run-off.

This alternative includes institutional controls and Site fencing as described in Alternative LF-2. Regular monitoring and a five year review would also be required as described for Alternative LF-4.

ALTERNATIVE LF-7: NEW RCRA HAZARDOUS WASTE CAP

Estimated Capital Cost:	$47,879,000
Annual Operation and Maintenance:	$369,000
Estimated Present Worth:	$49,564,00
Estimated Implementation Time:	3 years

Under this option, the existing cap would be removed, spread over the Site, and used as the first layer of fill. A new RCRA cap would be placed over the entire landfill area, which will be determined in design. As described in Alternative LF-6, the RCRA cap is a multi-layer cap

that combines several layers of cover materials such as soil, synthetic membranes, and clay to provide erosion and moisture control, in addition to containing the contaminated solids. The total thickness of the entire cap system would be approximately six feet. The entire Site would be graded for proper drainage and seeded with grass for erosion control. The existing gravel-lined ditch would be incorporated in the design to aide in the collection of surface water run-off.

This alternative includes institutional controls and Site fencing as described for Alternative LF-2. Regular monitoring and maintenance and a five year review would also be required as described for Alternative LF-4.

OPTION 1: NO DRUM REMOVAL

Estimated Capital Cost:	NONE
Annual Operation and Maintenance:	NONE
Estimated Present Worth:	NONE
Estimated Implementation Time:	NONE

Under this alternative, no excavation and removal of known buried drums and associated contaminants would be performed prior to capping.

OPTION 2: DRUM REMOVAL (EXCAVATION AND REMOVAL OF ALL KNOWN AND SUSPECTED BURIED DRUMS AND ASSOCIATED SOILS)

Estimated Capital Cost:	$514,000*
Annual Operation and Maintenance:	NONE
Estimated Present Worth:	$515,000
Estimated Implementation Time:	6 months

* The figure is only an estimate: the actual cost will depend on the number of drums encountered.

The excavation and removal of all known and suspected buried drums and associated contaminated soils prior to capping is an additional, separate option that could be used in conjunction with any or all of the containment Alternatives LF-3 through LF-7. Under this option, excavation would be initiated at test pit (TP) locations TP-6 through TP-17 and TP-19 until ground water is encountered, the fill area depth limit is reached, or until no more drums are found. All excavated drums and visually contaminated soils would be sampled and tested. Contaminated materials would be shipped off-site for disposal, possibly by incineration. The Site would be graded prior to installation of the selected cap.

XI. CRITERIA FOR EVALUATION

During the detailed evaluation of alternatives, each alternative is assessed against nine evaluation criteria. The nine criteria are described below:

Overall Protection of Human Health and the Environment addresses whether or not a remedy provides adequate protection and describes how risks are eliminated, reduced or controlled through treatment, engineering controls or institutional controls.

Compliance with Applicable or Relevant and Appropriate Requirements of Federal or State of New Jersey Regulations addresses whether or not a remedy will meet all of the applicable or relevant and appropriate requirements of other environmental statutes and/or provide grounds for invoking a waiver.

Long-Term Effectiveness and Permanence refers to the ability of the remedy to maintain reliable protection of human health and the environment over time once cleanup goals have been met.

Reduction of Toxicity, Mobility or Volume addresses the anticipated performance of the treatment technologies that a remedy may employ.

Short-Term Effectiveness involves the period of time needed to achieve protection and any adverse impacts on human health and the environment that may be posed during the construction and implementation period until cleanup goals are achieved.

Implementability examines the technical and administrative feasibility of a remedy, including availability of materials and services needed to implement a particular option.

Cost includes capital, operation and maintenance costs, and net present worth.

State Acceptance indicates whether, based on its review of the RI/FS Reports and the Proposed Plan, the State concurs with, opposes, or has no comment on the preferred alternative at the present time.

Community Acceptance will be assessed in the Record of Decision following a review of the public comments received on the RI/FS Reports and the Proposed Plan.

The following is a comparative analysis of the alternatives based upon the evaluation criteria noted above.

XII. ANALYSIS OF CRITERIA

The NJDEP and the EPA are required to select the remedial alternative which offers the best balance among the nine criteria above. The selected remedy must meet the first two criteria, protection of human health and the environment, and compliance with ARARs, unless a waiver for ARARs is granted. The manner in which the preferred alternative meets the nine criteria is briefly discussed below.

Overall Protection of Human Health and the Environment

Except for the No Action and Minimal Action alternatives, all of the containment alternatives, LF-3 through LF-7, would minimize the potential human and ecological risk associated with surface soil, sediment and air pathway exposure to an acceptable level. These alternatives would also minimize precipitation infiltration to the waste, thereby reducing the potential for contamination migration. The Sip Avenue ditch sediments would be isolated from future exposure potential.

However, capping would result in the loss or alteration of terrestrial and aquatic wildlife habitats in the PJP Landfill area. Some estuarine emergent wetlands would be capped as part of the proposed actions. Shallow water aquatic habitat in the Sip Avenue ditch would be lost as a result of the proposed filling. These actions generally would result in a loss of some wetland-associated species from the immediate Site area and in the loss of aquatic life from the ditch area. Terrestrial species adapted to grass/field environments are likely to inhabit the area once vegetation has been established on the cap. In order for the capping alternatives LF-3 through LF-7 to meet this criterion, wetlands mitigation activities (i.e. restoration, land banking) would have to be implemented at the Site.

Option 2, the excavation and removal of all known and suspected buried drums and associated contaminated soils option, in conjunction with any of the capping alternatives, would provide protection of human health and the environment by reducing on-site contaminant concentrations.

Compliance with ARARs

Actions taken at any Superfund site must achieve ARARs of federal and state laws or provide grounds for waiving these requirements. The No Action, Minimal Action, and LF-3: Soil Cover Alternatives do not comply with federal and state ARARs which regulate the closure and capping of either solid waste or hazardous waste landfills.

The No Action, Minimal Action, and other capping alternatives do not address contamination in Sip Avenue Ditch sediments which are at levels in exceedance of the criteria set forth in the NOAA sediment screening criteria. However, the capping alternatives all provide for replacement of the Sip Ave ditch with an alternative form of drainage, and would also provide protection from rainwater infiltration, thus reducing potential migration of subsurface contaminants into the groundwater. An additional benefit is that, once capped, the contaminants would present no direct contact hazard.

As part of the IRM in 1986, an estimated 10,000 drums were disposed off-site. ARAR compliance would be aided by Option 2 (excavation and removal of the other buried drums and surrounding contaminated soil) in conjunction with any of the capping alternatives.

Because No Action and Minimal Action alternatives do not meet both threshold requirements of overall protection of human health and the environment or compliance with ARARs, they will not be considered further in the evaluation of alternatives.

Long-Term Effectiveness and Permanence

The capping alternatives would promote surface water run-off; cap implementability may offset the need for ground water collection and treatment. RI data has shown a significant reduction in contaminant concentration in the ground water on the previously capped portion of the landfill. This would suggest that each capping alternative would aid ground water in the process of natural attenuation, while at the same time isolating the Sip Avenue Ditch sediments from future exposure potential. However, the capping alternatives do vary in permeability. The least permeable cap will provide the least migration of landfill contaminants off-

site. Alternative LF-7, New RCRA Hazardous Waste Cap, has the least permeability while LF-3, Soil Cover, has the greatest.

Option 2 : Drum Removal (Known and Suspected Buried Drum Areas and Associated Contaminated Soils) in conjunction with a capping selection is the most effective in the long-term and the most permanent because the most concentrated areas of contamination would be permanently removed (in addition to the estimated 10,000 drums that were previously removed) from the Site and contaminated materials would then be shipped off-site for disposal, possibly incineration.

Short-Term Effectiveness

In general, effective alternatives which can be implemented quickly with little risk to human health and the environment are favored under this criterion. The containment alternatives without the excavation option have high short-term effectiveness because they could be implemented relatively quickly (within three years) and would have relatively minor short-term risks to nearby workers, residents and commuters.

Construction of any of the containment alternatives would involve some excavation and handling of contaminated soils during the initial Site regrading, but exposure could be reduced through the use of suitable protective clothing and equipment. Exposure of the surrounding community through fugitive dust emissions could be easily controlled using standard construction practices and air monitoring. Short-term risks to the community, workers, or the environment are expected to be minor. Reduction in exposure risk is achieved in the short-term.

However, the excavation, removal and off-site disposal of buried drums and associated contaminated soils option (Option 2) provides potentially hazardous conditions for the workers, community, commuters on the Pulaski Skyway, and the environment. The potential explosive nature of the test pit drums and the relatively close proximity to workers, residents and commuters increases the risks associated with this option.

Reduction of Toxicity, Mobility or Volume

The containment alternatives without the excavation option would prevent direct contact with the contaminated Sip Ave Ditch sediments and reduce mobility by preventing the migration of contaminants by air and erosion. The cap would also reduce leaching of contaminants into ground water. However, these alternatives alone would not reduce toxicity or volume of the contaminants.

Option 2, the excavation and removal of all known and suspected buried drums and associated contaminated soils and off-site treatment, reduces the toxicity, mobility and volume of the contaminated material. In addition, the capping alternative would further reduce the mobility of any contaminants remaining on Site after excavation.

Implementation

All of the alternatives are implementable from an engineering standpoint. The capping alternatives without the excavation option are easy to implement with the technology, equipment and resources being established and readily available. The RCRA Hazardous Waste Cap alternatives, LF-6 and LF-7, would take longer than the Solid Waste Cap alternative due to the multiple layer construction.

The excavation and removal of all known and suspected buried drums and associated soils option is feasible, however, the implementation would present some difficulty due to the potential health and safety hazards. This option would also add to the length of time required to implement the remedy.

Cost

The costs of the capping alternatives are all the same order of magnitude, with the least expensive being the Solid Waste Cap $22,022,000 and the most expensive being the NJDEP Hazardous Waste Cap $35,029,000 and the New RCRA Hazardous Waste Cap $47,879,000.

The excavation and removal option, Option 2, increases the cost of each of the capping alternatives. Although subsurface contamination is not a current risk pathway, the excavation and removal option affords a degree of long-term effectiveness and permanence by excavation, removal and off-site treatment of all known and suspected buried drums and associated highly contaminated visually stained soil. In addition, this option would minimize any future ground water contamination which may occur as the result of wastes contained in these known and suspected buried drum areas. Therefore, the cost of the value added from the reduction of subsurface contaminants may be warranted by reduc-

ing and possibly eliminating, the need for long-term, ground-water pump and treat.

XIII. SUMMARY OF THE PREFERRED ALTERNATIVE

After evaluating the various alternatives, NJDEP and EPA recommend the combination of Alternative LF-4: NJDEP Solid Waste Cap (extending existing cap), replacement of the Sip Ave ditch with an alternate form of drainage, and Option 2: Excavation, Removal and Off-Site Disposal of All Known and Suspected Buried Drums and Associated Contaminated Soils Prior to Capping, as the preferred alternative for addressing the remedial objectives at the Site.

This alternative involves:

- Removal of all known and suspected buried drum materials and associated visibly contaminated soils;
- Capping the remaining landfill area of the Site with a multi-layer, solid waste cap in accordance with NJDEP Bureau of Landfill Engineering Guidance with gas venting;
- Extending the existing gravel lined ditch around the perimeter of the Site to collect the surface water runoff;
- A passive gas or active venting system installed in the new portion of the cap. However, if an active system is deemed necessary, both areas will be included;
- Site fencing and institutional controls (e.g., deed restrictions and public information program);
- Quarterly inspections and maintenance, and a re-evaluation of the previously capped area, after five years;
- Replacing the Sip Ave ditch with an alternate form of drainage;
- Quarterly ground water monitoring to evaluate the reduction of contaminant concentrations over time;
- Modeling to demonstrate the effectiveness of the cap by predicting the impact of ground water leachate migrating to the Hackensack River from the landfill under the conditions at the end of the 5 year period; and
- Implementation of a wetlands assessment and restoration plan.

The multi-layer cap would comply with NJDEP sanitary landfill closure requirements. Since removal of all known and suspected drums and associated contaminated soils would remove the significant hazardous waste deposited in the landfill, closure utilizing a RCRA hazardous waste cap is not necessary. The use of a passive or active gas venting system would be determined during the remedial design phase of the project.

In order to provide for adequate protection against water infiltration at the site, periodic inspections of the cover installed during the IRM will be performed. If the cap is found to be damaged or degraded, then at least one additional foot of topsoil will be added to the cover. Ground water and surface water monitoring will be performed quarterly, initially, to evaluate the reduction of contaminant concentrations and to determine if natural attenuation is occurring at the site. The Site would be reviewed at the end of five years in order to reevaluate Site conditions. The review would include an analysis of the monitoring data, which would be used in a ground water model aimed at determining the need for further action. The review will also include an assessment of current residual health risks, an evaluation of the effectiveness of the Site fencing to control access, and an evaluation of what additional remedial measures, if any, should be implemented based on the reviewed Site conditions.

The preferred alternative provides the best balance among alternatives with respect to the evaluation criteria. NJDEP and EPA believe that the preferred alternative would be protective of human health and the environment, would comply with ARARS, would comply with the Remedial Action Objectives, would be cost-effective, and would utilize permanent solutions and alternative treatment technologies or resource recovery technologies to the maximum extent practicable.

The excavation and removal of all known and suspected buried drums and associated highly contaminated soils is protective of human health and the environment. The preferred alternative provides for long-term effectiveness and permanence by removing and treating the highly contaminated materials from the Site. The long-term effectiveness and permanence of the alternative outweigh short-term risks associated with excavation.

Remedial Investigation and subsequent sampling results indicate that contaminants' concentrations in the shallow aquifer are reducing over time. Ground water contamination in the deep aquifer is at concentrations below any

level of concern at the present time.

Implementation of the preferred alternative (i.e., capping and removing drums) will reduce the leaching of contaminants into ground water. The five year ground water and surface water monitoring and modeling program will enable NJDEP to evaluate what, if any, impact ground water or leachate is having on the Hackensack River. If a significant adverse impact is found, NJDEP will evaluate the need for hydraulic controls to mitigate this impact.

The preferred alternative provides protection to human health by preventing direct contact with the contaminated material, and by preventing the migration of contaminants by reducing infiltration and erosion. Moreover, the combination of this alternative and the excavation and removal of all known and suspected buried drums and associated contaminated soils option, would satisfy the statutory preference for remedies which utilize treatment as a principal element.

The implementation of a qualitative assessment of the habitat value, acreage, tidal influences and other defining factors will characterize the wetlands and better provide requirements for the restoration of any wetlands found to be impacted.

NJDEP realizes the inherent short-term risks associated with excavation and removal of buried drums and associated contaminated soils. For this reason, NJDEP would implement a comprehensive Site Health and Safety Plan to mitigate the short-term risks to nearby workers, residents, and commuters.

Maintaining the level of risk reduction afforded by the proposed remedy depends on preserving the long-term integrity of the cap and enforcement of institutional controls. Institutional controls would include use restrictions to restrict future use of the Site and public information programs to increase the public awareness of potential problems associated with the Site. The NJDEP Solid Waste Cap has proven to be a very effective and reliable remedial technology. Implementing the NJDEP Solid Waste Cap also presents few short-term risks. In addition, the NJDEP Solid Waste Cap with the incorporation of the existing cap provides the maximum protection to human health and the environment at a reasonable cost.

GLOSSARY

This glossary defines the technical terms used in this Proposed Plan. The terms and abbreviations contained in this glossary are often defined in the context of hazardous waste management, and apply specifically to work performed under the Superfund program. Therefore, these terms may have other meanings when used in a different context.

Bis(2-ethylhexyl)phthalate
Bis(2-ethylhexyl)phthalate is a type of phthalate ester, an organic compound widely used as a plasticizer in the construction and automobile industries, and in the production of household products, toys, clothing and medical products. Plasticizers are added to plastics or other materials to keep them soft or pliable. Phthalate esters are suspected carcinogens and are currently being studied to better understand their effects on human health and the environment.

Cap
A layer of material, such as clay or a synthetic material, used to prevent rainwater from penetrating and spreading contaminated materials. The surface of the cap is generally mounded or sloped so water will drain off.

Carcinogen
A substance that causes cancer.

Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA)
A Federal law passed in 1980 and modified in 1986 by the Superfund Amendments and Reauthorization Act. The Acts created a special tax that goes into a Trust Fund, commonly known as Superfund, to investigate and clean up abandoned or uncontrolled hazardous waste sites. Under the program EPA can either: pay for site cleanup when parties responsible for the contamination cannot be located or are unwilling or unable to perform the work; or, take legal action to force parties responsible for site contamination to clean up the site or pay back the Federal government for the cost of the cleanup.

Closure
The process by which a landfill stops accepting wastes and is shut down under federal or state guidelines that ensure the public and the environment are protected.

Exposure Pathways
The route through which an individual can come into contact with a contaminant. Inhalation of contaminated air and ingestion of contaminated water are examples of two exposure pathways.

Ground water
Water found beneath the earth's surface that fills pores between materials such as sand, soil or gravel. In aquifers, ground water occurs in sufficient quantities that it can be used for drinking water, irrigation and other purposes.

Hot Spot
An area or vicinity of a site containing exceptionally high levels of contamination.

Inorganic Chemical
A class of chemical compounds not containing carbon and composed of minerals, including salts and metals such as lead, zinc and iron.

Interim Remedial Measure (IRM)
An action that can be taken quickly to limit exposure or threat of exposure to a significant health or environmental hazard at sites where planning for remedial actions is underway.

Landfill
A disposal facility where waste is placed in or on land.

Leaching
The process by which soluble chemical components are dissolved and carried through soil by water or some other percolating liquid.

Migration
The movement of contaminants, water, or other liquids through porous and permeable rock.

National Oil and Hazardous Substances Contingency Plan (NCP)
The Federal regulation that guides the Superfund program.

National Priorities List (NPL)
EPA's list of the most serious uncontrolled or abandoned hazardous waste sites identified for possible long-term remedial response using money from Superfund. The list is based primarily on the score a site receives utilizing the Hazard Ranking System. The NPL is updated at least once a year.

Operable Unit
An action taken as one part of an overall site cleanup. For example, a carbon adsorption system could be installed to halt rapidly spreading ground water contaminants while a more comprehensive and long-term remedial investigation and feasibility study is underway. A number of operable units can be used in the course of a site cleanup.

Organic Chemical
A class of carbon containing compounds derived from living organisms.

Parts Per Million (ppm)
Units commonly used to express low concentrations of contaminants. For example, one drop of benzene in one million drops of water means that the water contains 1ppm benzene.

Petroleum Hydrocarbons
Petroleum hydrocarbons are a complex mixture of chemicals derived from crude oil. Petroleum hydrocarbons include natural gas, mineral oil, gasoline and asphalt.

Polycyclic Aromatic Hydrocarbon (PAH)
PAHs, such as pyrene, are a group of highly reactive organic compounds found in motor oil. They are a common component of creosotes and can cause cancer.

Present Worth Cost
The sum of money invested at a given rate of compound interest that will accumulate to pay for the implemented remedial action at a future date.

Record of Decision (ROD)
A public document that explains which cleanup alternatives will be used at National Priorities List sites where the Superfund program pays for the cleanup. The Record of Decision is based on information and technical analysis generated during the remedial investigation/feasibility study and consideration of public comments and community concerns.

Remedial Investigation/Feasibility Study (RI/FS)
A two part study which must be completed before Superfund cleanup can begin. The first portion, the RI, examines the nature and extent of contamination at the site. The second part, the FS, evaluates several possible alternatives for addressing contamination problems.

Resource Conservation and Recovery Act (RCRA)
A Federal law that established a regulatory system to track hazardous substances from the time of generation to disposal. The law requires safe and secure procedures to be used in treating, transporting, storing and disposing of hazardous substances. RCRA is designed to prevent new, uncontrolled hazardous waste sites.

Responsiveness Summary
A summary of oral and/or written public comments received by EPA during a public comment period on key EPA documents, and EPA's responses to those comments.

Runoff
The discharge of water over land into surface water. It can carry pollutants from the air and land into receiving waters.

Sediment
The layer of soil and minerals at the bottom of surface waters, such as streams, lakes, and rivers, that absorb contaminants.

Surface Water
Bodies of water that are above ground, such as rivers, lakes, and streams.

Wetlands
An area that is regularly saturated by surface water or groundwater and, under normal circumstances, capable of supporting vegetation typically adapted for life in saturated soil conditions. Wetlands are critical to sustaining many species of fish and wildlife. Wetlands generally include swamps, marshes, and bogs. Wetlands may be either coastal or inland. Coastal wetlands have salt or brackish (a mixture of salt and fresh) water, and most have tides, while inland wetlands are non-tidal and freshwater. Coastal wetlands are an integral component of estuaries.

Public Meeting and Comment Period

For the Proposed Plan for Remediation at the

PJP Landfill Superfund Site

Jersey City, Hudson County, New Jersey

Public Meeting: **Thursday, August 18, 1994 at 7 p.m.**
Jersey City Municipal Building
280 Grove Street, Jersey City, N.J.

Comment Period: **Tuesday, August 2, 1994 through Wednesday, August 31, 1994**

Site Background and Current Status

The PJP Landfill Superfund Site is an approximately 87-acre inactive landfill located at 400 Sip Avenue, Jersey City. The site was operated as a commercial landfill by the PJP Landfill Company, accepting chemical and industrial waste, from approximately 1968 to 1974. From 1981 to 1986 continuous subsurface fires, attributed to spontaneous combustion and decomposition of landfill materials, occurred on a 45-acre portion of the site. In 1982 this site was placed on the United States Environmental Protection Agency's (USEPA) National Priorities List (Superfund).

An Interim Remedial Measure (IRM) was initiated by the New Jersey Department of Environmental Protection (NJDEP) in 1985 and involved the use of an experimental foam injected into and on top of the landfill which successfully suppressed the subsurface fires. In addition, the IRM involved excavating a portion of the landfill, removing drums and other contaminated debris, installing a gas venting system and the replacing and recompacting the remaining excavated materials. A cap, including a layer of top soil, was placed over the 45-acre portion of the landfill and the area was seeded. This work was completed in May of 1986.

In 1988 NJDEP contracted ICF Technology, Inc. to perform a Remedial Investigation (RI) and Feasibility Study (FS) for the site. The RI, completed in 1990, identified areas and levels of contamination at the site. The FS, which developed and evaluated various remedial alternatives for addressing the site contamination, was completed in 1992. Additional studies performed by NJDEP were completed in 1993.

Proposed Plan and Preferred Alternative

The Proposed Plan, based on the RI, FS and other site-related studies, describes the remedial alternatives considered and identifies the preferred alternative along with the rationale for this preference. The remedial alternative preferred by NJDEP for remediation of the PJP Landfill includes the following components:

- NJDEP Solid Waste Landfill Cap (extending the existing cap), with a gas venting system.
- Excavation and off-site disposal of known and suspected buried drums and associated contaminated soils.
- Ground water and surface water monitoring.

(over)

New Jersey Department of Environmental Protection
Site Remediation Program
(609) 984-3081 • Bureau of Community Relations

Documents Available for Review in Repositories

Copies of the Remedial Investigation, Feasibility Study, Proposed Plan and other site-related documents will be available for review beginning August 2, 1994 at the following locations:

Jersey City Municipal Building
Engineering Division
280 Grove Street
Jersey City, NJ 07302
Contact: Betty Kearns at (201) 547-5000

NJDEP
Bureau of Community Relations
401 East State Street, CN 413
Trenton, NJ 08625-0413
Contact: Mindy Mumford at (609) 984-3081

Jersey City Public Library
472 Jersey Avenue
New Jersey Room, Third Floor
Jersey City, NJ 07302
Contact: Joan Lovero at (201) 547-4503

Community Role in the Remediation Process

NJDEP and USEPA solicit public comment on the Proposed Plan during the public comment period which runs for 30 days from August 2, 1994 through August 31, 1994. No decision on remedial action will be made until all public comments are evaluated. The final decision document, the Record of Decision, will include a summary of both oral and written comments and the NJDEP/USEPA responses to these comments. Written comments on the Proposed Plan should be sent to:

Donald J. Kakas, Acting Chief
Bureau of Community Relations
New Jersey Department of Environmental Protection
CN 413
Trenton, NJ 08625-0413

General questions should be directed to Mindy Mumford, NJDEP Community Relations Coordinator for this project, at (609) 984-3081

New Jersey Department of Environmental Protection
Site Remediation Program
Bureau of Community Relations
CN 413
Trenton, NJ 08625-0413

IN RE:

PUBLIC MEETING TO DISCUSS
THE PROPOSED PLAN FOR REMEDIATION OF THE
PJP LANDFILL SUPERFUND SITE

Place: Jersey City Municipal Building
280 Grove Street
Jersey City, New Jersey

Date: August 18, 1994

PRESENT:

TOM COZZI, SECTION CHIEF
Bureau of Site Management
Division of Publicly Funded Site Remediation
New Jersey Department of Environmental Protection

MARCEDIUS JAMESON, SITE MANAGER
Bureau of Site Management
Division of Publicly Funded Site Remediation
New Jersey Department of Environmental Protection

DOUG HENNE, PROJECT MANAGER
ICF Technology, Inc.

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116 Youngs Road
Trenton, New Jersey 08619

(609) 586-2311 FAX NO. (609) 587-3599

MR. COZZI: Can everybody hear me from the back of the room? Am I projecting back that far if I speak at this level? Yes? Okay. We'd like to get started. I'd like to say good evening and welcome to everyone who could make it. My name's Tom Cozzi. I'm a Section Chief at the Bureau of Site Management, New Jersey Department of Environmental Protection.

I'd like to ask that everyone who didn't get a chance to sign in in the back of the room, if they could please sign in. I guess I'm not speaking as loud as you'd like. We could shut the fans off if that would help. I'm kind of -- I'm kind of losing it already.

(Pause)

MR. COZZI: If you get a chance, if you could please sign in in the back of the room. That helps us with our future mailings on the site and all the information that we disseminate on the site. So we'd appreciate that.

We're here tonight to discuss the remedial activities for the PJP Landfill Superfund Site in Jersey City. I'd like to point out that in the back of the room also there's a handout and that handout includes several things. It's got an agenda for tonight's meeting in the front and then followed by that there's a little short summary of a little bit about the program and background of the site and it kind of skips to the preferred remedy for the site. After that there's a summary of the different alternatives that we looked at and a summary of

the costs of those. And then there's the proposed plan itself which details a discussion of what we looked at and why we're proposing the remedy that we are. And then following that, there's a little community relations summary that points out a lot about the Community Relations Program and the Superfund Program. And then after that, there's a meeting evaluation form which we would ask that if you all could take a couple of minutes and fill that out after today's presentation. You know, we'd like to take that information back and improve the presentations as much as possible.

We are here tonight to both share information with you and get your comments and questions. Community involvement is very important to our program. So we welcome your comments and questions. Later on, after the presentation, the floor will be open for any questions that you might have and the only thing that we ask is that you step up to the microphone in the middle of the room because we are transcribing the meeting and so that all your questions can be easily understood and transcribed into the meeting. We'd appreciate it if you'd step up to the microphone.

The comment period, the period where we take in all the comments on the site, has been extended. Originally it was August 31st, but now it's been extended to September 30th by request of the public. So we can take comments on the proposed plan up until September 31st -- I'm sorry, September 30th.

We'll try to keep our presentation brief to give you sufficient time for comments and questions. We hope that you also limit the length of your comments, if possible, so that everyone who wishes to speak gets a chance to speak. We'd like you to hold your comments and questions until the end of the presentation so that we can get through the presentation and then we'll try to answer any questions you have at that time.

I'd like to acknowledge other DEP representatives that are here with us tonight. Mindy Mumford from Community Relations is here tonight, Ann Hayden, a technical coordinator, Dave Kaplan, the geologist on the site and at this time I'd like to introduce Marcedius Jameson who's the project manager on the site and he'll go over a little bit of the history and the background of the site. And then we'll have our contractor from ICF represented by Doug Henne and he'll give us a little presentation of the study that was performed and the results that were found. So, Marcedius.

MR. JAMESON: Good evening. At this time what I'd like to do is give you a complete view of the site history and a little background so that you could better understand where we are and how we actually got to this point.

Now the site occupies approximately 87 acres, okay. The site's bordered on the northwest side by the Hackensack River. You've got Sip Avenue Ditch which bisects the site, carries surface water run-off and sewer run-off from Jersey

City through the site. You've got the Pulaski Skyway which cuts across the site. On the southwest -- on the southwest side you've got -- on the other side of the street, you've got multiple dwellings and housing units. Okay.

Now the site was originally a soil meadow, okay, and a portion of it was condemned back in 1932 for that Pulaski Skyway itself. The PJP Landfill Company actually operated the site as a landfill for commercial waste, okay. And now the operation is believed to start accepting chemical and industrial waste from '68 to about 1974. The company obtained a six-month NJDEP certificate for registration for solid waste back in 1970. After it expired, they applied for a new certificate. But in July of 1973 the Department uncovered some steel drums and later were asked to cease the operations. The company or DEP actually found garbage debris and other hazards at the site. Operations are believed to have ceased in 1974, but it was never properly closed.

Now we have subsurface fires on approximately 45 acres of the site which were in 1988 actually capped by the Department. The fires were put out by a company called Boots and Coots and the landfill was actually capped.

Now we had approximately a million cubic yards of material that we excavated and these were grossly contaminated soils, cylinders, drums, and as again, I say it's approximately 45 of the 87 acres. So what we'll basically be dealing with

tonight for the most part is the additional 42 acres.

A fire break trench line was put along the site to break up the fire, keep it from spreading out. Okay. At this point what I'd like to do is to turn it over to Doug and have him go through the exact -- exactly what we did in terms of the remedial investigation.

MR. HENNE: Thanks, Marcedius. Hopefully everybody can hear me. If not, raise your hand or something. Let me know and I'll try and talk a little bit louder.

In 1988, ICF was hired by New Jersey DEP to perform a site investigation on the PJP Landfill Site. And with that, there's -- there's two elements to it. One is to perform a remedial investigation or RI as it's called, and the second part is to study -- is to do a feasibility study or an FS. The RI is to determine the nature and extent of the contamination and that's what I'd like to go through the RI and how we got our results first and then I'll come back and do the FS.

Under the remedial investigation activities, we performed site sampling and these included such media as surface water, sediments, air, groundwater, soils, test pits and a jumping screen as you can see.

A SPEAKER: Sorry.

MR. HENNE: That's okay. Next slide. The surface water that we sampled and also the sediments were related to along the riverbank of the Hackensack and also to the Sip

Avenue Ditch. This is a photo of the Sip Avenue Ditch that Marcedius had pointed out to you on the map before that transects from Jersey City over to the Hackensack. Again, here's a map showing the Sip Avenue Ditch coming across right in the middle of the site. This portion here is also the 45 acres that was capped during the IRM.

One of the things that we also sampled for was the gas venting of the landfill that was capped. There are 45 vents on the landfill. It was divided up into eight different grids and we did a preliminary screening of those vents and then sampled the highest -- highest concentration vents in each of those eight grids. This is what one of the vents looks like at the landfill.

We also performed surface soil sampling. The surface soil sampling activities were restricted to the area that was the former drum staging area when they performed the IRM which is down in the southeast corner of the property.

Monitoring wells were installed in 24 individual different wells. On the map here you see the locations of single and cluster wells. There should be 17 locations there. The drill rig showing how we installed some of the monitoring wells and collected the soil boring samples.

For doing the excavations of the test pits since there was thought to be shock sensitive drums in the landfill, we did this operation using a remote control backhoe. The operator

sat in this little device, a little cage so to speak, and in there he has a TV monitor that shows exactly what he would see if he were sitting at the backhoe. And the distance from the backhoe is about 100 feet away. This picture shows you the test pit location. There were a total of about 19 test pits that we looked at in all. The two locations where drums were found with in the top above the Sip Avenue Ditch and the square on the bottom below the Sip Avenue Ditch. The top was thought to be this shock sensitive drum area and the one on the south side of the ditch was the regular non-shock sensitive drums. Again, another picture of some of our test pit excavation. The excavations in generally averaged about 360 cubic feet in size. They varied depending upon the actual terrain and what was found on the site.

The analysis that were performed during the remedial investigation included analysis for volatile organic compounds, VOC's or semivolatile organics, for petroleum hydrocarbons, pesticides, PCB's and heavy metals. The results that we concluded with the analysis were that the gas vents, each one of them was within acceptable limits for discharge. When you took an average, they also were within acceptable limits. For a worse case scenario, looking at the maximum discharge though, the gas vents do present a possible problem.

The surface soils we discovered arsenic that exceeded the proposed soil cleanup criteria, and this is mostly on the

surface, surface being defined as originally when we started out the top six feet -- top six inches. That has since changed. But the arsenic was still found in that top layer of soil. In the subsurface soil the primary contaminant that was found was a phthalate material. This is something present typically in plasticizers, pesticides and it really comes from the naphthalene family of compounds. Sediments, we found heavy metals and petroleum hydrocarbons. And this was mostly in the Sip Avenue Ditch location. In the test pits, we found both VOC's and again heavy concentrations of phthalate material.

In 1993, the State performed a supplemental RI to do some additional sampling, to check on the conditions, to see how they changed on the site and also to confirm some of the decisions or the conclusions that were reached at the end of the original RI. And this included putting in additional wells into the bedrock to check for the deep aquifer. This also included another round of sampling of some of the shallow wells. Again, surface water and sediment sampling was performed and bioassays were also performed.

The bedrock wells were determined to be clean. None of the -- nothing was found in excess of any of the cleanup or standards at the time, the shallow wells at slightly elevated levels as did also the surface water and sediments. The bioassays were inconclusive. The bioassay is to see how biota survive living in the environment present by the contaminants.

Next slide.

The locations for the supplemental activities are shown on this map. You can see along the Hackensack River was where the samples were taken for surface water sediment as were too of the influent and effluent of the Sip Avenue Dip. And in the other locations you see within the site itself translate into the bedrock and the shallow wells that were sampled.

The risk posed by the site under current land use was determined that ingestion and dermal contact from the contaminant samples was really the worst case scenario. And this was based on looking at a child wading and playing in the Sip Avenue Ditch. The inhalation of the landfill gasses was also considered a problem, particularly under the maximum or worst case scenario. Under future land use, again you have similar situations and if you're going to do any construction or use the site for any future activities, material within the test pits might be a problem for excavation or building activities.

The purpose then, after you conclude the RI, the purpose of the FS is to look at alternatives to the cleanup, evaluate them and to try and come to a recommended solution to remedy the site. The feasibility constructed by ICF was done as a three-phase approach. First of all, we did a phase one to identify any alternatives. Phase two, we tried to screen those alternatives to try and get the number of alternatives down to

a manageable size. And the phase three was to actually do a detailed analysis and cost estimate on the few that remained.

The remediation objectives are to prevent contact with contaminated segments, to mitigate any of the gaseous emissions, prevent additional contamination by infiltration and to mitigate any site contamination into the Hackensack River.

The alternatives that were examined are the seven that you see up here on the screen. Number one is a no action which basically means that you leave the site as it is. You look at it at the end of a five-year period and assess what has changed. Limited action is to perform fencing, limited institutional controls and again do monitoring over -- over a period of every five years.

Three through seven involve a cap of some sort of another, the first one being a soil cover similar to what was done with the IRM. Four through seven relate to an actual capping that comes under regulations of either solid waste cap, a RCRA or a hazardous waste cap. The differences between these caps really vary depending upon the size, meaning the thickness of the capping and the membrane and the construction details. And needless to say, as you go up in the number for the cap alternative, you also go up in the relative costs. Item seven does include digging up the existing IRM cap and installing a whole new RCRA hazardous waste cap over the entire 87 acres of the landfill.

With any of the capping alternatives, we also then look at options related to any of the known drum contamination. Option one being do nothing, leave the drums where they were. Option two was to do a drum removal at those locations.

The evaluation criteria that you see here should be nine criteria that were used to evaluate any of the alternatives in the feasibility study. With them, they're all given basically equal support for protection of the environment, implementability, cost. And with that I'd like to turn over to Marcedius again for the preferred alternative.

MR. JAMESON: Okay. As far as the preferred alternative, after evaluating the seven you saw on the board plus the two options, the Department felt and the EPA felt that the best fit would be a combination of the New Jersey solid waste cap, as you see at a cost of 22 million approximately, and this is an engineer's estimate, and then option two which would be the drum removal. And the drum removal would consist of digging up any known or suspected drum areas that exist. And we know of approximately two areas that would have to be excavated and carted away.

Now the solid waste cap would actually tie into the existing cap on the remaining 42 acres. And we say 42 acres, this is an approximation, okay. We'd install a gas venting system, extend the gravel lined ditch which would help carry off the surface water run-off, install fencing, continue monitoring

and site reviews, probably participate in some institutional controls, replace the Sip Avenue Ditch with another form of drainage. As you saw, the Sip Avenue Ditch was one of our pathways to contamination, so we'd like to cover that. And then we'd go through what we consider a groundwater monitoring -- modeling program, basically to ensure that the groundwater is under control, groundwater contamination actually get into the Hackensack River. Now this alternative we feel best fits the needs of the remedial objectives. We have another.

Now the cap would actually consist of 12 inches of soil, okay, as a first layer on what's currently out on the site. Then we have a 40 mil which is called HDP which is high density polyethylene liner, almost like a thick plastic. On top of that, we have 12 inches or 18 inches, I'm sorry, of what's a drainage layer consisting of sand and on top of that 12 inches of top soil. On top of it we would then hydroseed, called vegetating the cap.

Now what the preferred alternative actually does and the rationale which we use is that we expected to do is to eliminate the direct contact, reduce the volume of contaminants actually at the site, significantly reducing infiltration of water, okay, in effect drying up the landfill of any moisture that's there producing leachate, maximize the risk, okay, in terms of -- I'm sorry -- minimal risk to implementation, that is any workers that are at the site or surrounding area making

sure that we contain the problems within the site. And it's the most cost effective we feel to give us what we need in terms of protectiveness. And we know that capping and the monitoring program is actually reliable and proven technology. At this point, I turn it back over to Thomas Cozzi.

MR. COZZI: Yeah. At this point, that really ends our active presentation. Now what we'd like to do at this time is turn the floor over to any questions you might have and when we do that, we'd like to -- if you could raise your hand and then come up to the microphone. Yes, sir.

A SPEAKER: I have a few questions. One first relates to the area directly south of the 42 acres or 45 acres you had previously capped which would be the area to Duncan Avenue and actually even south of Duncan Avenue. I'm sure you're aware that in the late '80s in the area defined as Lincoln Park West, there also were in fact underground fires which had to be -- companies had to be brought in to put out. What studies have been done to see whether the effects of this landfill due to its closeness to in fact the river have spread any contaminants onto either the land between where this site ends and Duncan Avenue and even south of Duncan Avenue?

MR. COZZI: I'll address that. Yeah, I am aware that there were fires. I think -- I believe in 1986, you're referring to, there were some --

A SPEAKER: '86 or '87 --

MR. COZZI -- '86 or '87 there were some fires in that area, and I know Boots and Coots, actually the same company, came in who put out the PJP landfill fire. This site that we are studying right now is the -- ends where the Duncan Avenue line is, where that street line is. My understanding is that the fires were put out. I don't know. I think they did find some drums and they were removed. However, I don't know that -- I personally don't know of anything else that's been done in that area.

A SPEAKER: Well, can the DEP come in and require that some additional testing be done in that area? There have been subsequent to that much of a much more minor nature, but also other occurrences where there fires in the back there that were attributed to being of an underground nature, I think, as late as a couple of year ago.

MR. COZZI: Yeah, that's -- I'm sorry. That's something that I can bring back to my managers, and then we'll--

A SPEAKER: Because I don't know how far it spread. I don't know exactly historically what had been dumped there during the same period that there was dumping being done at the--

MR. COZZI: Yeah. I'm not exactly sure what's been done in that area, but I, you know, we'll be happy to check on that and we'll get back to you with an answer on that.

A SPEAKER: Okay. The other question is, the proposal of your preferred remediation, I'm reading here about long term changes in land use. In this proposal, what steps are taken to at least create the best opportunity that there can in fact be potential development in there in the future? I mean, urban areas are land barren. They don't have a lot of land for development. If there was no environmental problems here this would clearly be a prime development site. I know now in Elizabeth they're taken what used to be a landfill and they're going to convert it into a over a million square foot shopping center. Clearly it wasn't a chemical landfill, but I mean, it's the same basic theory. What -- because I know you have to put vents in -- what steps are taken or are any taken that enhance that possibility that someone can come in at a future date to do development here?

MR. COZZI: Okay. It's kind of difficult at this point for the Department to look down the road on -- as far as the development goes to the property. There are complicated legal factors involved. I mean, we don't -- the Department does not own the property. There are the owners of the property. You know there are other responsive that we're trying to go after for the cleanup. So it's kind of complicated about how we can -- how the land could be developed in the future. Right now what we're trying to do is focus on the remedial action which is going to deal with a proper closure of the landfill right

now. And then I would -- I would -- you know, our closure I'm sure wouldn't be inconsistent with something that could possibly be done down the road. But for us to look that far down the road, you know, like I said with complicated legal factors involved, it's kind of difficult. But we still want to go forward with the cap and then, you know, down the road, I'm sure that's a possibility, that the land probably could be reused.

A SPEAKER: And this isn't a criticism of DEP, but -- and I commend what was done there and what even now you're proposing do there -- but it appears that every time a site gets cleaned up it gets cleaned up to the minimum level that you require someone to clean it up to, and then anywhere you go in an urban area with a large fenced in area, I could tell you that it was a site of chromium or a site of some level of kind of contamination. And I think that some kind of program needs to be done so these sites could be reclaimed and eventually used for some kind of an economic development purpose, because just -- urban areas just don't have the kind of land for that anymore, and I don't know how or if it's too late prior to doing this, that you could consult some people that in fact are familiar in development to see whether there's ways of -- or what can be done to try to preserve as much property as possible for potential future development. Okay. Thank you.

MR. COZZI: Okay. Do we have any other questions on

the floor? Yes, sir.

MR. GARITANO: Gary Garitano from Hudson Regional Health, a local county environmental health agency. We'd generally like to support the Department's decision to choose additional remedial actions and to cap the site. I just have some questions in -- with the addition of approximately 40, 45 acres to the site beyond the initial IRM, it looks like you've added some properties that are currently active, be they junkyards, truck parking, that sort of thing. How do you propose to initiate, you know, further actions there while these facilities are still operating?

MR. COZZI: Once the design starts, there are areas on the landfill proper. There are businesses, I think even the junkyard, active junkyard. And we would have to pursue, you know, ways to remove them from the property so that we can cap it. I mean, those -- the junkyard, for instance, cannot stay where it is. We would have to -- that part has to be capped.

MR. GARITANO: Okay. What about the north side of the ditch where the truck stop is and the vacant land behind the truck stop?

MR. COZZI: The areas by the truck stop, and I believe there's like a recycling facility and different things that back up to the landfill, things like that which are -- have like buildings in place and, you know, concrete floors and things, we're planning on just taking the cap up, you know, and

this would have to be designed, up to a reasonable place behind that area, because those -- you know, we already consider that area capped as far as we're concerned. What we're trying to do is cap the site and protect, you know, infiltration into the groundwater, and any areas that we can see that already, you know, buildings, like the Hartz buildings and things like that, any areas that we feel already do that, I mean, we wouldn't certainly go in and touch those.

MR. GARITANO: All right. If you're not aware of it, you should be aware that behind the truck stop, I guess over the past year, year and a half, they brought in approximately 40,000 to 60,000 yards of fill which is shredded asphalt material, very high in PAH's, and it's currently the subject of litigation between the Department and the property owner. All right? And that sort of abuts the ditch, and I know you're concerned about PAH in the ditch. That's -- and the ditch also, you mentioned, there is -- I believe Jersey City Engineering can tell you better -- I believe there's a combined sewer overflow into the ditch, so that'd have to be dealt with and the drainage.

MR. COZZI: Yeah. This will be dealt with in the overall design of the cap.

MR. GARITANO: That's it. Good luck.

MR. COZZI: Thanks. Does anybody else have any other questions? I thought if I wait long enough we'd have --

MR. FOREGANG: I am -- I'm Jeff Foregang. I represent one of the responsible parties at the site. We've had occasion to visit the site, I also am the chairman of the technical committee for the PRP Group. We have visited the site on several occasions in the past six to eight months, and have physically seen evidence of continued dumping, of not only demolition refuse but what I believe to be chemical items, drums and whatnot. Has the Department considered some types of mechanisms to prevent this from recurring and exacerbating the issues?

MR. COZZI: Well, currently right now we have a fence around the entire site, up until the point where it reaches the Hackensack River. If there's areas that you know about that you feel -- which I'm not aware of -- that there's some sort of dumping taking place, we really would like you to come forth and --

MR. FOREGANG: This area occurs behind the truck stop and in and around the Hartz building.

MR. COZZI: Well, you need to --

MR. FOREGANG: East of the IRM.

MR. COZZI: What you probably need to do is come talk to us and then, you know, we'll take a look at that. And there's nothing that I'm aware of that's occurring back there. Yes, sir.

MR. KRAUS: My name is Kirk Kraus. I represent one of

the potentially responsible parties. How many are there, approximately, do you know?

MR. COZZI: It's my understanding, not to get into too much of legal details, but my understanding right now, there's some sort of litigation pending against about 32 responsible parties.

A SPEAKER: Thirty-two -- 22 --

A SPEAKER: No.

A SPEAKER: -- approximately --

A SPEAKER: -- 32 --

MR. COZZI: I may be wrong in the number, but --

A SPEAKER: It's about 32 if you count the orange.

MR. COZZI: I'm not heavily -- I'm not -- hold on a second. I'm not heavily involved in the legal issues, and you know, so, I mean, I'm just -- this is my information. That's about what I know.

MR. LIEBMAN: My name's Paul Liebman. I represent one of the PRP's of the site as well. I'm wondering if you could pull up the map on one of the slides, show us where the 87 acres are, draw a boundary line, how you determine those 87 acres and where the additional 42 that are going to be covered by the cap, what -- what that encompasses.

MR. COZZI: The 87 acres is the total.

MR. LIEBMAN: Total of what?

MR. COZZI: Total land, what we consider the landfill.

When you say 87, I'm just trying to clarify the numbers. There's 87 total acres, which is an estimate, obviously.

MR. LIEBMAN: Does it include all the area with the buildings? Does it include Hartz Mountain? What does it include?

MR. COZZI: Okay. The landfill has basically -- let me go over the bounds with you. This is Duncan Avenue on this side, Hackensack River. So those are the bounds of the landfill. Truck Route 1 and 9, which crosses past the Sip Avenue Ditch. And there's landfill material up behind Hartz -- the Hartz building. And there's landfill out in this direction. We know that there's fill in the whole area back there. I happen to be fortunate enough to have been the on site coordinator who was on the project when they actually put the fire out. From being on that site I know that there's fill in all that area. Where the cap is going to end, where the remediation that we're doing is going to end, would be basically up to the building and in these areas back here.

MR. LIEBMAN: Coming back down to Duncan Avenue?

MR. COZZI: When you say -- what do you mean by back down to Duncan Avenue?

A SPEAKER: South.

A SPEAKER: Coming --

A SPEAKER: Going south.

A SPEAKER: Coming south.

MR. COZZI: It would include all this area. Now this area right here is capped already.

A SPEAKER: Right.

MR. COZZI: That's what we did in the IRM. We put out the fire, capped it. That's about 45 acres. The rest of it is about 42 acres. That is where we're getting the total of about 87 acres.

MR. LYNCH: Just -- I'm Jack Lynch. I became involved in that on the legal side. Are you saying down to -- down to Duncan Avenue itself and all the truck facilities --

MR. COZZI: No. No, no, no.

MR. LYNCH: -- that are on the north side of Duncan Avenue?

MR. COZZI: The way this is capped now, if you have been on the site, there's a drainage ditch that runs along this side and it discharges into the Hackensack. That's where the remediation is. The other side of that is -- there's a fence--

MR. LYNCH: Yeah, there's a whole bunch of trucks --

MR. COZZI: -- and then there's a truck stop on the other side, Duncan Avenue. No, that's not part of the site.

MR. LYNCH: Apart from your personal knowledge, having been the coordinator earlier, how do we know that there's fill other than what's already been capped? We've got ground penetrating radar --

MR. COZZI: -- fill --

MR. LYNCH: -- or photographs or, you know --

MR. COZZI: We've sunk --

MR. LYNCH: -- just kind of the same question this gentleman was asking, which is --

MR. COZZI: We've sunk wells in that area. There's 17 wells that we -- right, Doug, throughout the area?

MR. HENNE: There is 17 --

MR. COZZI: And from those wells and from -- there's been different activities, a recycling facility. We -- I've been out there while they were actually disturbing the material in that section, so we know there's fill out there.

MR. LYNCH: You mean you drill the wells, the garbage comes up, or what are you saying?

MR. COZZI: Yeah, as they drill the wells they do borings, and then from the borings they can see the material --

MR. LYNCH: Are there logs of that sort of thing?

MR. COZZI: Excuse me?

MR. LYNCH: Are there logs of it?

MR. COZZI: Yes, we have all the logs available, if anybody wants to look at them.

MR. LYNCH: Incidentally, during the course of this you've shown us all some photographs. Are there reams of photographs, or just a couple?

MR. COZZI: How do you define reams?

MR. LYNCH: Well, you showed a picture of the fire, you

know. We all remember the fire, I think. I -- is there records of that going back and --

MR. COZZI: There were photographs taken of the --

A SPEAKER: We've got videos --

MR. COZZI: -- when we put the fire out and so forth --

A SPEAKER: We've got videos --

MR. LYNCH: Yeah --

MR. COZZI: Yeah, there are some photographs --

MR. LYNCH: You got video --

MR. COZZI: Video --

MR. LYNCH: I mean, do you have bunch of them? Are they in the record for this proceeding or are they just --

MR. COZZI: I don't know that all the photographs are in the record, you know. Well, we're trying to keep -- we were trying to keep the record to as -- you know, the record of course can get humongous, but what we tried to consolidate the record to is what we need ~~a need~~ and what we use to make the decision of where we're going from now, from this point.

MR. LYNCH: Yeah, but one of --

MR. COZZI: So I mean, we don't usually include everything that was ever done. You know, we try to keep the administrative record to what the department and EPA are utilizing, what information we're utilizing to make the decision that we're making, or the -- to present to you the preferred alternative that we're presenting.

MR. LYNCH: Yeah. There's some -- particularly about the scope of this stuff, there's some stuff in the document you handed out, like, it was reported that dumping was going on, and over this broad an area. And if there are photographs of it that'll help -- on which that report was based, that sort of thing --

MR. COZZI: You're talking about --

MR. LYNCH: -- the extent of this going to be significant to the cost.

MR. COZZI: Are you talking about photographs of what occurred before the Department took over? I guess I misunderstood your question.

MR. LYNCH: No. I -- again, it's recurring to the basic question here of how big is it? How much cap is going to have to go on there?

MR. COZZI: Well --

MR. LYNCH: And the scope of it, if there are photographs of the place, you know, partly we're interested in finding out if there's anything in the photograph to indicate other people might be liable from those that are -- there apparently are more than 32 people dumped here, right? I mean--

MR. COZZI: I -- if you would like more information on that, basically what your line of question is about who's responsible, et cetera, basically -- all I can do is put you in

touch with our attorneys, and they --

MR. LYNCH: No, I'll deal with Frank. What I'm saying is what's in the record from which you conclude that this thing goes over 45 acres.

MR. JAMESON: Any investigation, background investigation, is clearly documented. As far as --

MR. LYNCH: Well, that's what I asked --

MR. JAMESON: -- pictures and actually catching someone and watching someone dump --

MR. LYNCH: No, no, and I don't --

MR. JAMESON: -- it probably doesn't exist.

MR. LYNCH: -- I don't expect that, really. I expect that you're going to have photographs of --

MR. JAMESON: Yeah. This -- I think there's even old photographs of the 1970's of them ~~trying to go~~ turning over the landfill. You know, I'm sure there's some photographs in the file --

MR. LYNCH: I mean, it looks like some of that was -- might have been done while they were doing the work --

MR. COZZI: Yeah, they were actually doing the work --

MR. LYNCH: Our job is to gather all the information and do the best we can with it.

MR. ~~COZZI~~ Jameson: But that information, based on what we see a lot of times in the administrative record is what we needed to make a decision. Those photos weren't needed to make a

decision. The photos were only documentation as to what we were doing --

MR. LYNCH: Yeah, I --

MR. ~~COZZI~~ Jameson: -- for future reference for us, you know, for situations such as this.

MR. LYNCH: But some --

MR. COZZI: Not to make a decision. Those photographs had nothing to do with our decision.

MR. LYNCH: Well, somebody's made a decision about the scope --

MR. COZZI: Right.

MR. LYNCH: -- that we're going to have to do 45 more, or 42 more acres.

MR. COZZI: Well, that's an approximation. That's basically the landfill that's defined. That's the landfill that's been defined as a superfund site.

MR. LYNCH: Well, that's my question. How do we know that that's a landfill?

A SPEAKER: And how do we know the chronology of dumping? I mean, clearly that's a large area. There was a lot of fill and the filling -- landfilling activities regionally have occurred 50 or 60 years, and we're talking a scope of '69 to '74. I think the group's a little bit concerned about how the Department arrived at the geographic boundaries of what was fill attributable to PJP -- ~~financial~~ Landfill company and fill that

might have crossover into some other activities, some other responsible entities if, you know, you can draw the lines clearly on a map, but in reality that area that's been used for filling activities, both industrial and --

MR. LYNCH: Municipal.

A SPEAKER: -- refuse from for years here.

MR. LYNCH: Right. I mean, like the first gentleman brought up the question about the dumping further down in Lincoln Park West, south of Duncan. I mean, somebody decided, well, this is PJP and that's some other and you've agreed to, pursuant to his request, to go look at what's going on there, but we're kind of asking what's in the record that makes you believe that this is the PJP part and that's somebody else's part.

MR. COZZI: Well, it's a little tough to answer your question. I mean --

MR. LYNCH: Well, I understand that.

MR. COZZI: -- you're probably -- you're asking me to try to figure out what -- I mean, what we're trying to decide a remedy on tonight is the portion of the site that was originally found to be the PJP landfill -- let me finish my answer, if you could, please -- there was an operating landfill facility that accepted waste. Okay? And to the best of our ability we've tried to determine the boundaries of that, which are the ones I described. Now if there's any other information

that makes you believe it's larger than that or smaller than that --

MR. LYNCH: I want to know how you concluded --

MR. COZZI: I mean a lot of these are probably legal questions about when things started, when things ended, you know. I'm just like a technical person. I can't -- it sounds like a lot of things you're asking are legal questions that need to be talked --

MR. LYNCH: No -- understand that --

MR. COZZI: I mean the whole area is still --

MR. LYNCH: -- in full -- in full --

MR. COZZI: If you go under the road it's probably a lot of fill in there, so --

MR. LYNCH: No, but in full respect of what you're saying, I don't disrespect the effort you put in or slight it, but you come into a number of 22 million dollars that is a function of so much cost per acre times so many acres, and the -- and I'm asking you, did you reach a process to figure out how many acres that was or is that really you're starting point? Were you given the task, here's 87 acres, figure out a remedy for that? Is it part of the record on which you are making technical judgments that this is an 87 acre site or is this simply your starting point, and that affects the way we have to approach it, because if it's part of the record we'd like to see that and make comment on this period. If it's done

by some other administrative agency then we're remitted to our legal remedies, and we'll go to those, and we -- you've got good counsel. We've got a good relationship with ~~home~~ him -- work it --

MR. COZZI: The site as -- that site that we're dealing with currently today is the one I described. I went over all the borders of the site. If you want I can go over it again, and where it ends.

MR. LYNCH: No, I'm asking how were those borders determined for the purposes of what you --

MR. COZZI: They were determined --

MR. LYNCH: -- is that part of your process or was that--

MR. COZZI: From -- no, from our --

MR. LYNCH: -- was that an assignment you were given?

MR. COZZI: -- historical records, from our study of the site, from the knowledge we knew about the site at the time we did the study, you know, we do ~~final~~ file reviews and all the other stuff. So basically that's the knowledge we have. I mean, that's the area of -- the site was ~~Rankin~~ ranked on Superfund, and that's the site that we ~~started~~ studied. And I don't know what else I can tell you other than that.

A SPEAKER: Did you --

MR. LYNCH: Well, I think you're telling me that all the information necessary to reach the decision is the -- that

this is an 87 acre PJP site is in the record that has led to your decision, and that's what I'm asking.

MR. COZZI: To my knowledge the information is in there.

MR. LYNCH: Okay. So it's in the -- okay. Well, we'll check those records and go from there with it.

MR. COZZI: Okay.

MR. LYNCH: That's what I'm asking. Thanks a bunch.

MR. COZZI: Okay.

A SPEAKER: And from a technical perspective, Marcedius, did you test pit to sort of get a feel for what wasn't fill and -- I mean, the lines of demarcation are clear on the drawing.

MR. JAMESON: Yeah. There's --

A SPEAKER: I mean, beyond --

MR. JAMESON: -- I think we -- you and I have talked about this before, and we said, and it says in the proposed plan, that during the design the landfill will clearly be defined as to especially what happens on the side opposite the capped portion of the Sip Avenue Ditch. That's an area that's in question and that's what most people here have a problem with, with the buildings' ongoing operations. Where do we stop? Where does the landfill end? And that will clearly be determined in the design. Now as far as the cost, he asks is it a starting point? Yes, it's a starting point, but you have

to start somewhere. And according our records it's an 87 acre landfill. Now it could be a little less, it could be a little more, based on what borings will tell us in design. And, you know, you understand that. Right? So at the design phase, and maybe we'll find that we can stop at some point short of 87. I mean, I think that --

MR. COZZI: But our intention is not to go beyond those -- those established areas that, you know, active facilities that have -- I mean, like the recycling facility.

A SPEAKER: I would counter that, but I think this is probably not the forum, and you're receiving --

MR. COZZI: Yeah, I'd like to not get too much into legal aspects and --

A SPEAKER: Well, I'm not --

MR. JAMESON: -- we'll be talking in the next couple of weeks, so it's --

A SPEAKER: I'm not an attorney, but you'll get our comments.

A SPEAKER: I don't want to beat a dead horse here, but can you give us an example of some of the kinds of documents or sources you used to determine that landfill is 87 acres? What types of things did you look at?

MR. JAMESON: You've got historical records. Investigators have tracked truckers, even sampling on at the site itself as --

MR. COZZI: -- we've gone over a lot of them already. I don't -- I don't -- specifically --

MR. JAMESON: -- repeating --

MR. COZZI: -- what you're getting at.

MR. JAMESON: Actually what you should do is, if you haven't already, take a look at what's in the repository, and then see what's there, and then submit some questions, and then we can ask -- answer them specifically.

A SPEAKER: I wouldn't be asking these questions if the information was in the repository. That's the reason I'm asking the question. Did you look at photographs? Are there some sort of historical documents that you looked at? Was there testimony taken from witnesses? What -- what is the basis? What type of things? I'm not asking for --

MR. JAMESON: Those are the kinds of things, for specifics, you should put those in writing and we'll address them at that time.

MR. COZZI: Does anybody else have a question? This gentleman here, please.

MR. GREEN: I just wanted to clarify what you said about the record. Are you saying that you didn't consider anything that's not in the record?

MR. COZZI: No. What I said was that we tried to put into the -- what we included in the administrative record and typically other lawyers take a look at what's in there. We had our

lawyers take a look at it in this case. Is what we consider important or key to the decision of the remedial action we're proposing to the public. That's what we put in the administrative record.

MR. GREEN: So you put in things that have to do with the remedy you think should be done, is that --

MR. COZZI: What -- what information that we needed or what information we used to draw the conclusion for the preferred remedy that we selected.

MR. GREEN: Okay. There was some talk, I think -- I'm sorry, I don't know how to say your last name. Is it Henne?

MR. HENNE: Henne.

MR. GREEN: Henne. There's some talk about worst case scenario being how you calculated risks to children from swimming in the ditch. What's that scenario?

MR. HENNE: The risk --

MR. GREEN: And what kind of exposure are you talking about?

MR. ~~HENNE~~ COZZI: Ann, do you want to take that? Do you -- we have Ann Hayden who's a technical coordinator might be a little better to address that.

MR. GREEN: Well it doesn't matter who answers it. I'm just asking.

MS. HAYDEN: The exposures of -- excuse me. I'm in the Bureau of Environmental Evaluation and Risk Assessment at DEP.

I'm one of those members of the case team. The exposures particularly that were looked at of concern for the -- which was somebody who's having dermal contact with the sediments. That's in answer to your question of the types of exposure.

MR. GREEN: How frequently?

MS. HAYDEN: And the concerns -- ingestion of the sediments. When -- when an assessment of the risks is performed, it's looked at as -- basically calculations are performed to determine what would be an average exposure scenario and what would be what's called a worst case scenario. So that's -- that's the risk assessment terminology.

MR. GREEN: What is the average scenario and what's the worst case that you used? Is it swimming every day? Is it once a year? Is it --

MS. HAYDEN: For that, I can pull up that detail from the remedial investigation report for you.

MR. GREEN: Is it all in there?

MS. HAYDEN: So you can -- it'll all be in there and we can respond to that comment specifically for you rather than to take the time now.

MR. GREEN: Okay.

MS. HAYDEN: It's all in the RI.

MR. GREEN: I was a little unclear -- you say that you're going to remove -- the idea is to remove soil and drums, is that right?

MR. COZZI: We want to remove what we call known -- when Doug was up there, he pointed out a couple of areas where we know there are drums. We did test pitting. We found drums. And our intention is to remove any areas that have known drums in them.

MR. GREEN: Where would you take that, whatever you removed?

MR. COZZI: We'd have to properly dispose of it off site.

MR. GREEN: Do you know where you would take it?

MR. COZZI: No. It depends on what you find. It depends on what -- I mean you have to basically analyze all that stuff. You have to sample it, determine what it is and then dispose of it. Basically we don't know what is in there. So we're going to have to do that -- handle it at the time we find out what's in there and dispose of it properly.

MR. GREEN: Well you have an estimate of $514,000 to remove the material. Does that include --

MR. COZZI: It's just an -- it's just an estimate. It could be -- it could be 100,000, it could be a million. We don't know. It's -- they're buried drums.

MR. GREEN: How did you do cost evaluation or analysis on a number if you don't know what the cost is?

MR. COZZI: They just took an estimate -- the contractor just took an estimate. When he opened the pits, he

tried to determine about how many drums were there and then tried to come up with an estimate. I mean it's just a ballpark figure. We don't know how many drums are in there and, you know, the cost is going to be obviously depending on how many drums you come across.

MR. GREEN: Is the 22 million dollars for alternative four that you have recommended, is that also just sort of a ballpark? I mean --

MR. COZZI: That's our engineer's estimate which is -- has a certain percentage of -- we have like a plus or minus percentage, you know, that that's off. It's just -- it's just an estimate.

MR. GREEN: What's -- what's -- what's the percentage?

MR. COZZI: What's the percentage that that's the accuracy about, do you know?

MR. HENNE: I think it's like about a plus or minus 20 percent.

MR. COZZI: Twenty percent, 30 percent, something like that. I don't remember the number.

MR. GREEN: So it could be as much as 20 percent of 22 million?

MR. COZZI: Higher or lower.

MR. GREEN: What is the margin of error based on? The 20 percent, where does that come from?

MR. COZZI: Well at this point -- let me just clear

something up. At this point what we're trying to do is just decide on what the remedy for this site should be, okay. From this point on, after this is -- the remedy's decided and we come to some agreement and we sign what they call a record of decision, at that point the designers are going to go out and take a lot more information. They're going -- there's a lot more information you need to design something than you do to draw a conclusion. Okay. What we're trying to do is just decide what the appropriate remedy is and then we'll take it to the next step, okay. We're not really -- we didn't try to gather like all possible information. I mean there's a lot of design tests we're going to have to do. So I don't know if I'm answering your question, but what we're trying to do now is just trying to decide -- we feel it's appropriate that the cap -- that the site should be capped appropriately and then once we make that decision, we're going to try to take it to the next step so that we can get out there, design the cap and a lot of these answers will be -- you know, a lot of these questions can be answered while it's being designed. There's a lot of things we don't know that the design engineers need to get out there to take a look at, you know, as far as the logistics of the site goes and go out there and actually do a design.

MR. GREEN: Well what I --

MR. COZZI: Our -- I'm still answering the question, if

you don't -- our contractor, what he did was he did like a conceptual design. They made assumptions there'd be so many vents. There'd be maybe a culvert in the Sip Avenue Ditch. There are things that they went through and they made assumptions so they could come up with a cost estimate that we could present to the public to give them an idea of the range of the type of costs that we're talking about that would be incurred when the Department goes forward with EPA and actually goes out there and tries to install something like this. We're just trying to give the public an idea what something like this would cost.

MR. GREEN: Okay. What I'm getting to is Mr. Jameson said there had been determination made that alternative four with option two was the most cost effective thing. I'm just trying to understand what that means.

MR. JAMESON: For protect -- for protection.

MR. COZZI: We feel the most cost effective of the alternatives that we looked at, we feel option four is for the most cost effective alternative as far as we're concerned for -- to remediate the site.

MR. GREEN: Well -- well I hear a lot about it being adequate to protect people. I don't hear -- or to do what you think in terms of protection. I'm not sure where -- how you made the determination it was most cost effective. Is there some sort of cost benefit analysis?

MR. COZZI: Well we took a look at the other alternatives and, you know, we looked at -- when you take a look at the alternatives, cost is one of the factors that we consider. And based on the alternatives that we looked at, we feel that the most -- that's the most cost effective of the alternatives that were considered.

MR. JAMESON: If you want to take a look at apples and apples, what we try to do is show you here with the summary, the cost summary. Now you see we have seven alternatives possibly here. Of the seven, compare the high and the low with what we have as a preferred, okay. Of the seven which we feel fit in terms of alternatives, and the evaluation is this is the one that best protects us, in effect is most cost -- is most cost effective with respect to the others. Now you can go overboard and go with, you know, what we feel is maybe a little higher, the hazardous waste cap, or go with soil cover. Soil cover won't do it and hazardous waste may be an over -- overkill. Therefore it's cost protective in the middle there.

MR. GREEN: Okay. Well I don't want to monopolize all the time. Thanks.

MR. JAMESON: Cost wise, I'm sorry.

MS. HAYDEN: Sir, can you please state your name and affiliation for the record?

MR. GREEN: My name is Brady Green. I don't have any real affiliation. I'm just here for informational purposes.

MS. HAYDEN: Thank you.

A SPEAKER: I just have a couple of questions, then I'll shut up tonight, I promise. The first one is, did the Department do any investigation to determine whether any of the neighboring sites were contributing to contamination on this site? Second, was any investigation done by the Department to determine whether the Hackensack River was in any way affecting the site, either positively or negatively?

MR. COZZI: There was -- to answer your question, two part question, you asked if any other sites were affecting this site. I'm not sure I know what that question means. I mean what we did was we study -- when we approach the site, we took the site as a whole and we studied the site itself to see what the contaminants on the site were and we're trying to take a look at how to address those. When you say other sites affecting that site, I don't really know what you mean. You mean --

A SPEAKER: Are there any sites that neighbor it, what you've determined to be the 87 acres, which are a source contributing to the contamination on the site?

MR. KAPLAN: He's talking about groundwater maybe --

A SPEAKER: Right.

MR. KAPLAN: -- moving onto the site. The answer is no. The only thing upgradient would be the cemetery to the east.

A SPEAKER: Not a likely source.

MR. KAPLAN: No. Well it might be --

A SPEAKER: Oh, yeah.

MR. KAPLAN: -- somebody -- but no, there's nothing else upgradient from the landfill. The only thing that --

MR. COZZI: I didn't understand the question. Okay. Thanks. I -- does that answer your question?

A SPEAKER: What about the Hackensack River question?

MR. COZZI: Would the Hackensack River contaminating the site, is that what you're asking?

A SPEAKER: Yes.

A SPEAKER: And the Sip Avenue Ditch as well.

MR. COZZI: Well we -- I don't know. Who wants to try to take that one?

MR. KAPLAN: The Sip Avenue Ditch is not contributing to it. We're contributing to the Sip Avenue Ditch because we have leachate from the landfill is entering the ditch and the same thing with the Hackensack River. The groundwater is moving into the Hackensack. It's not the other way around.

A SPEAKER: There's no interface between the groundwater on the site and the Hackensack River?

MR. KAPLAN: Well, there's a little tidal effect, very close, but it's not moving very far.

A SPEAKER: When you say close, how close is close?

MR. KAPLAN: Well we have wells that are 100 feet in

the landfill. It would vary a little on the elevations and it's only some tidal effect in --

A SPEAKER: Can you stand up so we can hear what you're saying?

MR. KAPLAN: Well I'm all done.

A SPEAKER: Oh.

MR. COZZI: Would you just repeat what you saying, please?

MR. JAMESON: Yeah, just repeat what you said.

MR. KAPLAN: Well the landfill -- he was asking about the Sip Avenue Ditch, whether that was that was affecting the landfill and whether the Hackensack River was affecting the landfill and it's just the opposite. The landfill -- leachate from the landfill is entering the Sip Avenue Ditch. That's why one of the objectives will be to cut that off in some way to prevent the leachate from getting into the Sip Avenue Ditch. And the same thing with the Hackensack River. The leachate from the landfill is entering the Hackensack River. There's no effect on the -- on the landfill from the river. Even though there is some tidal effect, slight moving back and forth, intermixing of the landfill and groundwater and the Hackensack River as the tide goes in and out.

A SPEAKER: There are no underground currents the same as down in the Lafayette section?

MR. KAPLAN: Underground -- there's groundwater, that's

underground.

A SPEAKER: No, underground. Downtown Jersey City, Van Horn Street, there's a school down there and one of the oil tanks was leaking. The way they found out is there was oil coming out of one of the sewers a couple of blocks away.

MR. KAPLAN: No, there's nothing like that.

A SPEAKER: And finally what the solution was --

MR. KAPLAN: There's nothing like that going on.

A SPEAKER: -- the tide comes in, goes under all the land mass downtown Jersey City and goes out again. I thought it was the same over there, because on the other side of the river, over in the Conrail yards, that's exactly what it does.

MR. KAPLAN: That's what I'm saying, there is --

A SPEAKER: The water goes underneath and then comes out.

MR. KAPLAN: There is some tidal -- there is some tidal effect. But the main flow is from the landfill to the Hackensack.

A SPEAKER: I just came in. You're not with the DEP. You're --

MR. KAPLAN: I'm with the DEP.

A SPEAKER: You're with the DEP?

MR. KAPLAN: Yes.

A SPEAKER: But what'd you do, you sank your wells?

MR. KAPLAN: Yeah, we had wells.

A SPEAKER: How deep are there?

MR. KAPLAN: We have wells that go down to 120 feet.

A SPEAKER: And they're --

MR. KAPLAN: From the water table --

A SPEAKER: Right.

MR. KAPLAN: -- which is 10 to 20 feet --

A SPEAKER: And they're sealed off at 120 feet?

MR. KAPLAN: Triple case wells, yes.

A SPEAKER: All right. And so --

MR. KAPLAN: They're sealed off from everything above it.

A SPEAKER: -- where does the sea -- where is sea level there in relationship?

MR. KAPLAN: Sea level?

A SPEAKER: Yes.

MR. KAPLAN: It's probably only a few feet below the groundwater at the land.

A SPEAKER: How far down is the groundwater, seven foot, 12 foot?

MR. KAPLAN: Fifteen, 10 or 15 feet.

A SPEAKER: Fifteen.

MR. KAPLAN: It depends on where you're at.

A SPEAKER: The monitoring well's at that depth?

MR. KAPLAN: We have wells at that depth.

A SPEAKER: Right.

MR. KAPLAN: And we have intermediate wells that go down about 50 feet and deep wells that go down about 120 feet.

A SPEAKER: Really? What in the world did they dump there?

A SPEAKER: Can I respectfully ask do you have --

MR. COZZI: Can I ask people to get up to the -- we're having like a little private conversation and no one can hear anybody. If we could please try to restrict questions from one person and we'll try to answer them. We're just trying to get everybody the answers to the questions. So I just ask that you'd please get up. Thank you.

MR. LYNCH: Yeah. This is Jack Lynch again. Just following up on your question. You were saying the groundwater in the landfill is about 10 to 15 feet what, below grade?

MR. KAPLAN: Somewhere in there.

MR. LYNCH: And what -- and what -- do we have sets of monitoring wells or whatever or physometers (sic), clusters to figure out how -- to support that?

MR. KAPLAN: Oh, yeah.

MR. LYNCH: And is that in the record here?

MR. KAPLAN: Right.

MR. LYNCH: Okay.

MR. KAPLAN: That's all in the --

MR. LYNCH: Thank you.

MR. COZZI: Okay.

MR. MACKELNICKI: Is there a representative from the EPA here?

MR. COZZI: Could you please get up to the microphone, sir, so we can hear you? Actually on the transcriber.

MR. MACKELNICKI: Hi. Steve Mackelnicki, Bayonne, New Jersey. Is there a representative from the EPA here?

MR. COZZI: Yes, there are representatives from EPA.

MR. MACKELNICKI: Okay. Is this -- have you published a booklet similar to this on Diamond Alkali site?

MR. JAMESON: That's a proposed plan --

MR. COZZI: That's probably a proposed plan for another site I would imagine.

MR. JAMESON: Another site.

MR. COZZI: We have -- we have a handout that has a proposed plan for this site at the door.

MR. MACKELNICKI: Okay. There's no federal requirement as to --

MR. COZZI: The federal government -- the federal government works -- is working with the DEP. If you look in the beginning, it'll say that they're in support to DEP.

MR. MACKELNICKI: Yes, I saw that.

MR. COZZI: We only put out one document like this. Either the State has the lead on the site, in which case EPA -- we consultate -- we consult with EPA and we both put out the document, but the Department runs the meeting. And then EPA

leads some of the Superfund sites and they -- you know, they run the meetings and the Department is like a support group to them. But in both cases, the DEP and EPA agree on what the preferred remedy is, which is the case here.

MR. MACKELNICKI: Okay. This one is directly then the responsibility of the New Jersey DEP?

MR. COZZI: We consult with EPA on the decision and actually the record of decision for the site, when that's published, that'll be put out -- well actually in this case probably put out by DEP and the EPA will concur with the record.

MR. MACKELNICKI: Okay. The --

MR. COZZI: So in other words both agencies are on board with the final remedy.

MR. MACKELNICKI: Who's paying for it?

MR. COZZI: Who's paying for it right now?

MR. MACKELNICKI: The remediation.

MR. COZZI: Right now this is being funded by the State of New Jersey.

MR. MACKELNICKI: Okay. The State will then pick up through the taxpayers paying for the remediation?

MR. COZZI: You mean who's going to pay for it from here on in?

MR. MACKELNICKI: Right.

MR. COZZI: What we would try to do is pursue

responsible -- what we call responsible parties are those who've contaminated the site, we try to pursue them first to pay for it. However, if that got held up, then the State and the federal government would proceed forth and fund it to eventually clean it up.

MR. MACKELNICKI: In which way?

MR. COZZI: Or to encase -- cap the site.

MR. MACKELNICKI: In which way?

MR. COZZI: Excuse me.

MR. MACKELNICKI: Funded in which way? What -- which department?

MR. COZZI: You know -- who would fund it?

MR. JAMESON: Shared responsibility.

MR. COZZI: We try to share the -- you know, the remedial action is shared 90 percent federal government, 10 percent State.

MR. MACKELNICKI: You had mentioned before with the leaching of the contaminants into the Hackensack, is that affecting directly or indirectly the dredging that's going on in the Newark Bay?

MR. COZZI: I don't know. Can you touch on that?

MR. MACKELNICKI: Is that adding to the contaminants that are there from the Passaic River?

MR. KAPLAN: There is -- there is some contamination but it's diluted when it enters the river. So it's hard to

detect and in the groundwater. And there is some contamination in the sediments right next to the landfill. But I don't think it's going very far.

MR. MACKELNICKI: Have tests been done on the Hackensack?

MR. KAPLAN: We've done -- we've sampled the river and the sediments, river water.

MR. MACKELNICKI: Are the numbers in here?

MR. KAPLAN: They're in -- they're in there.

MR. MACKELNICKI: Okay. Thank you.

MR. COZZI: Thank you. Anybody else have any other questions?

MR. RUBINO: Excuse me. I came --

MR. COZZI: Would you get up, please? Thank you.

MR. RUBINO: Excuse me. Frank Rubino. I arrived a little late. I didn't find out about the meeting until late. But I had briefly read over the pamphlet that was sent out about the alternative solutions that were explored. I saw nothing about on-site remediation. Why not?

MR. COZZI: What do you mean on-site remediation?

MR. RUBINO: What I mean by on-site remediation, and I'm prejudiced in this. I work with -- I worked with a company out in California called Solid Management, Inc. And what they do is they chemically remediate on-site lands as far as heavy metals. This thing I read over there's arsenic in it. And I

think what you should seek for is to restore this land area to Jersey City because we need the tax base in Jersey City very badly. This is very valuable property. And what I read it says you want to fence it off for five years and monitor it and spend how much, 50 million maybe.

MR. COZZI: No. There was selected -- the proposed remedies is about 20 million dollars.

MR. RUBINO: Well, suppose I say, before I came here I called up David Listiak down in Texas, gave him approximately, I think it's maybe two million cubic yards you have down there you's want to handle?

MR. COZZI: No, no. We excavated on the one portion of the site --

A SPEAKER: We did 1,033,000.

MR. COZZI: -- about a million cubic yards of material.

MR. RUBINO: All right. That's what you excavated already and there's slight contamination to it.

MR. COZZI: Well that did -- what we did in that area was put the fire out and remove drums and cylinders.

MR. RUBINO: Right.

MR. COZZI: There's still contaminants in that area as well.

MR. RUBINO: But why didn't you explore doing on-site remediation for the site to clean the land up and restore it to the tax base?

MR. COZZI: Things like that were looked at in a feasibility study. They were just screened out prior to getting to the final alternatives.

MR. RUBINO: I don't understand why. It would seem cheaper than some of the alternatives you've come up with.

MR. COZZI: Well they were explained -- I don't know if Doug can touch on some of that, but they were -- it's explained in the feasibility study. I don't know off the top of my head, but --

MR. HENNE: I don't either to be honest with you.

MR. RUBINO: All right. Who do we -- who do I address as far as the particular area's concerned? Maybe you's just overlooked it, I don't know.

MR. COZZI: You mean if you want to send comments in?

MR. RUBINO: No. Maybe you don't have -- you don't know about on-site remediation in New Jersey. I know it's done very extensively in New York.

MR. COZZI: I mean if you have specifics that you'd like to send to us on remediations of that type --

MR. RUBINO: Who's it get -- who's it get directed to?

MR. COZZI: It tells you in the proposed plan, if you pick up a handout, who to write to.

MR. RUBINO: Okay. It goes to the --

MR. COZZI: No. It'll get to us eventually but --

MR. RUBINO: And then it eventually get -- who's the

responsible person though that makes the decision? Is there a site manager?

MR. COZZI: We have a commissioner who makes the decision with a regional administrative of EPA.

MR. RUBINO: All right. That's all. But are you's endeavoring to restore it to the tax base or what happens if you fence it off and take it away from the tax base? It's been away from the tax base quite few years. And I say this because I have the -- a truck terminal around the corner, 530 Duncan Avenue, at the same time.

MR. COZZI: I mean what we're attempting to do is remediate the site in the most cost effective manner. As far as whether or not -- and I think what you're getting at is future land use. I said -- I think answered that. You probably weren't here. Somebody asked that question.

MR. RUBINO: No, I wasn't here. That's what I had said.

MR. COZZI: That gets to be a complicated matter because the Department doesn't own the property and there would be litigation with, I'm sure, property owners or whatever. I'm not a lawyer so I don't even know about as far as the dealings with all that.

MR. RUBINO: Well would the responsible party act -- the guy -- the people that own it are responsible. The people before them are responsible. Whoever dumped them are

responsible. Everybody's responsible.

MR. COZZI: Right. So that gets to be a legal issue of -- and down the road how that property can be developed, et cetera. It's nothing I can deal with as a technical person.

MR. RUBINO: Have you's thought about that at all? Yes.

MR. KAPLAN: Well we did this at one of other sites. You know where we -- you're talking about removing all the contaminants from the landfill. First of all, that's never been done at any landfill in New Jersey. We have 500 landfills. The cost would be prohibitive. We costed that out at another landfill.

MR. RUBINO: Right.

MR. KAPLAN: Timbuck (phonetic), I don't know if you've heard of that. But that's a 50 acre landfill which is across--

MR. RUBINO: Yeah. But you're doing -- you're doing --

MR. KAPLAN: -- smaller than this --

MR. RUBINO: You're doing this one. You're telling me the groundwater's at 16 foot.

MR. KAPLAN: Yeah.

MR. RUBINO: So how far are you going to go down to reline it?

MR. KAPLAN: Well -- we could only -- we could only go down pretty much to the water table.

MR. RUBINO: That's all.

MR. KAPLAN: But we did this -- we costed it out at ~~Timbuck~~ Kin-Buck landfill to remove all the contaminants and incinerate it and the cost was 2 billion dollars --

MR. RUBINO: Wait. How much -- how much did you remove from it presently that -- are you going to leave more there now?

MR. KAPLAN: They didn't remove anything. They just put out a fire. They took it away --

MR. RUBINO: No. At this site, at PJP they put out a fire. At this other landfill, you said it's going to cost 2 million -- 2 billion because --

MR. KAPLAN: It's not going to cost. We didn't do that. We capped it, the same thing we're doing here. It was too expensive.

MR. COZZI: He said they costed it out, what it would cost.

MR. RUBINO: Yeah, that's what I'm saying. But this one --

MR. KAPLAN: Yes. It's too expensive. It's too expensive.

MR. RUBINO: But then what you're indicating by that is that this particular landfill we know there are contaminants in. So many you pulled out. But how many are still in there?

MR. KAPLAN: They didn't pull anything out.

MR. RUBINO: I thought they had --

MR. KAPLAN: All we did -- all we did was put out a fire and cap it. There's nothing else --

MR. COZZI: The only thing we pulled out were known -- the drums that we found and the cylinders we found in the garbage.

MR. RUBINO: Oh, that were on the surface.

MR. COZZI: No. We excavated down to the water table and pulled them out, but we didn't take out all the contaminated material from the site.

MR. RUBINO: Right.

MR. COZZI: We only took out -- we only took out drums and anything that was around the drums, contaminated soil.

MR. RUBINO: So basically everything there is garbage, right, household waste, whatever else was dumped in it?

MR. COZZI: With contaminants mixed in, yeah.

MR. RUBINO: So I guess that's why all we can do is cap it. So that --

MR. COZZI: I mean it's -- also, that's a large landfill. I mean we're talking 90 acres of material which is a lot of material.

MR. RUBINO: Yeah. The concern for most of the business people in the area are we going to get more land? What's going to happen there? Are they going to shut down? I know Mr. Segal was very active. He couldn't get here tonight. He didn't even know about the meeting tonight in fact. I went

down to get him this afternoon. That's the owner of the truck stop down there.

MR. COZZI: Yeah. There were -- I know we put out ads in the -- I don't know if you want to mention the papers the ads were put in. You know, there was mailing of the proposed plan. So --

MR. RUBINO: So as it stands -- what happens to the other places, businesses in the area, are they affected at all? Will they continue to operate?

MR. COZZI: The only thing we're dealing with in this remedy is the 87 acres, approximately 87 acres of this landfill. So I don't know what you mean by -- it should affect--

MR. RUBINO: Well here, we have a business at 530 Duncan. The back fence, that's the landfill.

MR. COZZI: We're not doing anything where Duncan Avenue is.

MR. RUBINO: You's had the bulldozers, tractors going in there for months, years.

MR. COZZI: We're not -- we're not doing anything on the other side of Duncan Avenue. Does that answer your question?

MR. RUBINO: Behind Duncan you's aren't going to do anything?

MR. COZZI: On the other side of Duncan -- where Duncan

Avenue is.

MR. RUBINO: So it's just the other side of Sip Avenue?

MR. COZZI: Outside the fence.

MR. RUBINO: Thank you very much.

MR. COZZI: Anybody else have any other questions? Yes, sir.

A SPEAKER: (Indiscernible). Approximately how many drums are located on the site?

MR. COZZI: Could you step up? I couldn't hear you. I'm sorry.

A SPEAKER: Approximately how many drums are located on the site?

MR. COZZI: We pulled out approximately -- approximately 4,500 intact -- 4,500 intact drums from the landfill when we excavated the 42 acre portion of the site. We estimate drums that weren't able to be pulled out intact, in other words they were crushed, et cetera, we estimate at least another 5,000 drums of those were pulled out as contaminated soil. So that went in that volume. So right there we're saying, I think it says in the proposed plan approximately 10,000 drums were pulled out. And there are still drums in the landfill which we intend to pull out as far as the remedial action goes.

A SPEAKER: Where are the drums --

MR. COZZI: We don't know how many those are.

A SPEAKER: The drums that are --

MR. COZZI: The drums --

A SPEAKER: Where were they taken to?

MR. COZZI: Those were all disposed off site in different areas, I think some at landfills, some material was burned. They went all different places. I mean that information is available if you'd like it.

A SPEAKER: Did any of them have markings on them --

MR. COZZI: I believe there were some -- yeah, there were some drums with markings and all that evidence is being gathered and given to our legal -- our legal people, our lawyers. Is there anybody else with -- did you have a question in the back?

A SPEAKER: No. Somebody else -- go ahead --

MR. COZZI: Anybody else have any other questions? Yes, sir.

MR. GIORDANO: My name Greg Giordano. I'm a resident of Jersey City for the past 15 years and Hudson County all of my life. And I would just like to know as to how the DEP arrives at a procedure where upon you employed a principal of reasonable risk under a condition like this, where you say capping, capping is not the most effective and if you were to remove that material, as you say it's very cost -- costly, what is costly to people's lives? And where does the -- where do you draw the line and how do you arrive at this figure? And

it's kind of interesting that the interests -- corporate interests are more important than the well being and the health of the public. It just seems to be a process that goes on. And I would like to know as to how you arrive at that kind of sophisticated reasoning?

MR. COZZI: Well, I think there are a couple parts to your question. One of them is about the risks associated with the site. And there are standard risk procedures that we follow that are from EPA's guidance and policies. And we determine -- what we do is we take the site and we determine what the risks are posed by the site. And then what we try to do is to develop a remedy that best takes care of those risks. Okay.

As far as your other question about the public, we also have a duty to the public as far as taxpayer dollars is concerned. And this isn't -- Jersey -- this site in Jersey City is not the only site. There are like a 100 -- something like 115 Superfund sites in New Jersey. There's thousands of other sites in New Jersey that need to be dealt with. So a lot of this does come down to a money management situation where we have to deal with a lot of situations. And what we try to -- how we serve the public best is by doing -- protecting the public the best we can with the money that's available for each site. So that's how we try to proceed in the program.

MR. GIORDANO: Well it just seems -- it seems that

there's an inconsistency here. When we look at the radio -- the radium situation that was a problem up in Montclair and Wayne and there in Maywood, we see that the process of getting rid of that soil there was actually a process where you underpinned the actual residents to the point where the cost of the removal of that dirt was more expensive than the home itself. I'm not saying not to do it. Of course you should do it. But the point I'm making is that here we have a situation that there seems to be a kind of a preference or a partiality. I mean here -- Hudson County has been labored with this thing, with this -- with this dump site and it's kind of analogous or it's similar process that's going on with Liberty Park whereupon that place is contaminated and you're inviting people into it. And I just don't follow that reasoning of reasonable risk is a process that you allow in a park, and here in a residential area you're allowing a process of reasonable risk here. And I think it's only an aspect of sophisticated rationalization which actually moves into a sophisticated hypocrisy.

MR. COZZI: I don't know that I can touch on all of what you said. But as far as the radon material, I know that -- you know, not knowing much about it, that was a direct contact problem with the people in their homes.

MR. GIORDANO: Yeah, sure.

MR. COZZI: Your Honor, this landfill has been fenced

off in the interim. The fire was put out in the interim. And 20 something million dollars was spent on putting the fire out and capping that portion of the site. And --

MR. GIORDANO: Do you have a guarantee that that fire won't flare up again with the -- with the process of capping you used?

MR. COZZI: That cap's been -- that cap has been monitored for nine years now. We have a separate group who monitors the cap and they're out there every few months.

MR. GIORDANO: Can you tell me what kind of capping process you used?

MR. COZZI: That cap was six -- that cap was six inches of -- well, to start off with, the landfill was excavated down all the way to the water table and every -- all the material was -- the fire was doused in all the material. All the drums and material that we felt were fueling the fire were pulled out of the site and disposed of off site. The mother material was put back, regraded. Six inches of like a fill material was put down on top of that. Twelve inches of clay material was compacted on top of that. And then six inches of top soil and that was hydroseeded. That's why you see the cap in the nice condition that it's now with the grass growing and so forth. And that cap's maintained. A drainage swale was put around it for run-off and so forth. So --

MR. GIORDANO: But there still is a problem. There

obviously still is a problem though with it, isn't there?

MR. COZZI: Well that -- with that 45 acres of the landfill, we -- we've seen that the -- right now the direct contact -- there is no direct contact threat. That cap's --

MR. GIORDANO: Well you do have a drift off. You do have an aspect of this material going into the river obviously.

MR. COZZI: Well I'd like to answer your -- I mean, please let me answer your questions one at a time.

MR. GIORDANO: Yeah. Well --

MR. COZZI: That -- the cap that we have on there is protective as it is. We've taken a look at it. It's -- for nine years now we're monitored it. The cap's in good condition. So we don't feel that nothing -- anything else needs to be done in the area. We also have seen the groundwater improve significantly underneath the cap. We've done sampling over a period of time and it's shown that the groundwater is improving under the cap. So we feel that by capping the other portion of the site similar to this portion, that the groundwater will significantly improve in that area. The cap, as far as accessibility to children or anything else, the cap suffices to -- so that threat's removed. So basically the site will pose no threat to anyone after --

MR. GIORDANO: Well that's an assumption that the cap--

MR. COZZI: It's not an assumption. That --

MR. GIORDANO: Well it's not an absolute certitude that

that cap is going to say with you all the time forever and ever, don't you agree?

MR. COZZI: Well I don't know that anything in life's an absolute certainty but --

MR. GIORDANO: Well there are. There are ways of doing it. But as we say, it's cost prohibitive. And here again we come back to the position of what's the value of a life.

MR. COZZI: Well, you see, you have to realize too, when we take this material off site, and if some of it has to be landfilled or whatever, there -- we're moving this into another area that's still -- there's concerned with the public in that area as well to somebody's --

MR. GIORDANO: Well, hold it. Now you're moving the material that is toxic to where?

MR. COZZI: I mean if you were to move it from that site to somewhere else, we have concerns with moving it.

MR. GIORDANO: Sure.

MR. COZZI: There's concerns with, you know, hazards to people while --

MR. GIORDANO: Packaging it, packaging it and taking it to a toxic -- toxic dump site. Sure.

MR. COZZI: -- while you're moving it, et cetera. So all that stuff's weighed out when we make this decision.

MR. GIORDANO: Sure.

MR. COZZI: So we're --

MR. GIORDANO: Sure.

MR. COZZI: What we're proposing is we think is the best, you know, that we can at this point -- you know, if you have any other information, share it with us. But it's the best at this point that we feel that protects the public.

MR. GIORDANO: Yeah. But the method you employ -- you are employing is one of where you're taking and you are looking at the dollars as to how much it's going to cost to do -- to use the process, you see.

MR. COZZI: Well the dollars have to be factored in anything we do.

MR. GIORDANO: Well, you know maybe this is why -- you know there was a period of time where I can't remember the Senator, but he -- he suggested a user tax and whereupon you would be hitting -- in order to fund the Superfund properly. You would be hitting corporations like Exxon, Ciba-Geigy and various other big corporations that do a great deal of pollution and that would be funding the -- now of course this is out of your area. But it just seems that your budget is at a point of where you're -- you are -- risks -- you are employing a principle of reasonable risk.

MR. COZZI: No. We're -- let me just clear something up that you said that disturbs me. We are pursuing parties that have been responsible for that site, whether it be land owners or whoever disposed of material at the site. We are

pursuing them funding past costs and future costs. The details of that -- I don't have all the details of that. Our attorneys are dealing with that. So we are pursuing not having this be funded by the taxpayer, by someone else, we're pursuing that. We don't let that factor into our decision, however, on what meets -- is the appropriate action for a site. The Department--

MR. GIORDANO: Well I've heard --

MR. COZZI: Let me finish. The Department and EPA feel comfortable that we've taken a look at the alternatives, the current technologies. We've done a feasibility study which outlines all this information. And we feel comfortable that this is at least at this point the remedy we prefer to bring to you and, you know, that's the whole point of this meeting. Is that if you feel otherwise, you know, we will note it and then that'll be brought back and we'll factor it in.

MR. GIORDANO: Well, I'm only basing it on what the gentleman said. He must be a technician in this work?

MR. COZZI: He's a geologist.

MR. KAPLAN: No. I'm a site geologist.

MR. GIORDANO: He's a geologist and he says it'd be cost prohibitive.

MR. COZZI: Well he means -- you know, the cost for removing the entire site and doing something else with it gets to be so exorbitant and we're allowed under the Superfund

process that if something gets to be that large of an expense, that we can screen them out. The whole thing is a screening process.

MR. GIORDANO: So here again we come back to the point of reasonable risk.

MR. COZZI: We're taking care of the risks on the site. We're eliminating all the risks on the site by the remedy we're proposing. You're just not happy that the stuff's not removed.

MR. GIORDANO: Well I question the capping system. It can fault. And at the same time there are methods of doing it with a barrier system whereupon you'd put in a barrier and then filter the material there or truck it out, as he says. So I know there are other ways of doing it, but they are expensive. But the question I'm asking is that -- is that how do you make these judgments whereupon you do employ a principle of reasonable risk as it was, as it is for the past 18 years with Liberty Park. Which it doesn't make any sense at all, where that's a park and you're inviting people into the space instead of establishing a clean environment which is really working from a principle of a foundation is the clean environment and then you develop the park. But you people have been developing -- allowing the park to develop with the condition still that a comprehensive study never went on down there and you've never cleaned up the situation. So I mean this is -- this is -- there's a parallel to it, here as well as there.

MR. COZZI: Okay. I appreciate your comments, sir. Anybody else have any questions or comments you'd like to add?

A SPEAKER: Who's ICF --

MR. COZZI: Excuse me?

A SPEAKER: ICF?

MR. COZZI: ICF's our contractor. That's who Mr. Doug Henne works for, the contractor the Department hired to do the study and the feasibility study on this site.

A SPEAKER: Have you consulted with (Indiscernible)^Hazmark?

MR. COZZI: Excuse me?

A SPEAKER: Have you consulted with Hazmark?

MR. COZZI: I'm not aware of what Hazmark is.

A SPEAKER: (Indiscernible) hazardous waste people --

MR. COZZI: Consulted with them as far as this study goes? Not that I'm aware of, no.

A SPEAKER: Do you have an approximate (indiscernible)? How much is contaminated?

MR. COZZI: How much is contaminated?

A SPEAKER: Cubic yards.

MR. COZZI: To determine that would be another extreme expense to try to determine how much of that 87 acres down to the water table is actually contaminated. I mean that would be astronomically expensive to even try to determine that. We just do -- we just take so many samples over a site to try to characterize -- basically with a landfill, what we try to do is

characterize the site. You know, take samples throughout the site to try to determine the characteristics of the site. But there's no -- there's no way to -- there's way to determine it, but it'd be extremely expensive to try to determine how much exactly is contaminated.

A SPEAKER: Wouldn't it be fairly simple just to go around the perimeter of the site?

MR. COZZI: To determine how much is contaminated? I mean that would only -- we can determine how much material there is. How much of that's contaminated, I mean a lot of this, don't forget, was solid waste material that was dumped there too along with other waste, industrial, et cetera, et cetera. So whether -- you know how much is contaminated, is that your question? There's no really way of determining that figure. We know about how much -- we could probably say there's a couple million cubic yards of material in the site. But exactly how much of that is contaminated material versus other material, there's no way of knowing at this point. And that was one of the goals of our study, I might add. Is there any other questions?

Okay. Then we'd like to draw this to a conclusion. I'd just like to say in closing and just reiterate that as part of -- this is all part of the Community Outreach Program under the Superfund Program. We have a strong commitment for two-way communications and that's what the purpose of this meeting is,

to get the feedback from everyone. If you haven't already done so, again, I'd like to please state that if somebody -- if everybody can sign in on the back, that will assure that we can get out any future mailings, that you'll be on a mailing list which is information for the site.

All of the comments received during the public comment period, which is the meeting and any comments that we receive in writing up until September 30th which is the end of the comment period, will all be gathered together and all that will be considered as part -- before any final decision is made on the site. What we do is after this -- after this, we get all the comments together and then we'll come out with a record of decision which probably will be two or three months down the road which will eventually document the final decision that's made on the site and that'll be in the same repositories as the proposed plan and the other material and administrative record.

Any comments that you have, you could direct, and it's in the proposed plan, to Mindy Mumford who's our community relations coordinator and her phone number, I believe, is in the proposed plan as well.

I'd just like to thank everybody for coming and I appreciate your attention. Thank you.

(Hearing adjourned.)

* * * * * * *

C E R T I F I C A T E

I certify that the foregoing is a correct transcript to the best of my ability from the record of proceedings in the above-entitled matter.

J & J COURT TRANSCRIBERS
BY: BEATRICE A. CREAMER

DATED: August 21, 1994

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FILE #
40563-4

October 14, 1994

VIA HAND DELIVERY

Donald J. Kakas
Acting Chief
Bureau of Community Relations
Site Remediation Program
Department of Environmental Protection
CN 413
Trenton, New Jersey 08625-0413

Re: Public Comments on NJDEP's Proposed Plan for the PJP Landfill Superfund Site

Dear Mr. Kakas:

Pursuant to the New Jersey Department of Environmental Protection's ("NJDEP") Proposed Plan for the PJP Landfill Superfund Site, we submit the following as public comments on behalf of Edwin L. Siegel, Edlin Ltd., and Tooley's Enterprises:

(1) Summary Report, PJP Landfill Superfund Site, NJDEP Proposed Remedial Action Plan, Jersey City, Hudson County, New Jersey by Dames & Moore;

(2) PJP Landfill Comments to Proposed Plan Dated August 18, 1994 by Coopers & Lybrand;

(3) Compensable Takings Issues Associated with NJDEP's Proposed Plan for the PJP Landfill Superfund Site Submitted on Behalf of Edwin L. Siegel, Edlin Ltd. and Tooley's Enterprises; and

(4) Affidavit of Jane Dobson, Esq., Hannoch Weisman, a Professional Corporation.

In addition to our submittal of the above comments, we join in the PJP Landfill PRP Groups' comments prepared by McLaren Hart.

We thank you for your consideration of the enclosed. Should you have any questions, please feel free to contact me at (201) 535-5356.

Very truly yours,

KEVIN J. BRUNO

KJB/JD/wpc
Enclosures
cc w/encl.: All PRP Group Members

SUMMARY REPORT
PJP LANDFILL SUPERFUND SITE
NJDEP PROPOSED REMEDIAL ACTION PLAN
JERSEY CITY, HUDSON COUNTY, NEW JERSEY
DAMES & MOORE REF. NO. 29562-001-110

SEPTEMBER 29, 1994

PREPARED FOR: EDWIN L. SIEGEL
EDLIN Ltd.
TOOLEY'S ENTERPRISES

DAMES & MOORE

CRANFORD, NEW JERSEY

PJP LANDFILL SUPERFUND SITE
Jersey City, Hudson County, New Jersey

SUMMARY REPORT

COMMENTS TO THE NJDEP'S PROPOSED PLAN FOR THE PJP LANDFILL SUPERFUND SITE

1.0 INTRODUCTION

This Summary Report was prepared by Dames & Moore on behalf of Mr. Edwin L. Siegel in response to the New Jersey Department of Environmental Protection (NJDEP)'s Proposed Plan dated August 18, 1994 for the PJP Landfill Superfund Site located in Jersey City, Hudson County, New Jersey. The NJDEP has issued this Proposed Plan as part of its public participation responsibilities under Section 117(a) of the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) of 1980, as amended, and Section 300.430 (f) of the National Contingency Plan (NCP). The NJDEP has issued the referenced plan to solicit public comments pertaining to the remedial alternatives evaluated, as well as the preferred alternative selected to remediate the PJP Landfill site.

This report presents Dames & Moore's engineering and technical discussions and comments, as well as general recommendations for suitable alternatives, with respect to the NJDEP's proposed remedial action plan for the PJP Landfill site. Due consideration has been given to site conditions, environmental, geotechnical, and general engineering concerns, as well as the impact of the proposed remedial measures on the current and future site conditions.

For preparation of this Summary Report of our general discussions and comments, we reviewed the following documents:

- NJDEP's "Proposed Plan - PJP Landfill Superfund Site", dated August 18, 1994;

- Phase I Feasibility Study (FS) report prepared by ICF Technology Incorporated (ICF) dated November 15, 1989;
- Phase I Remedial Investigation (RI) Report, Volume 1 by ICF, dated April 1990;
- Phase II Feasibility Study Report by ICF, dated May 26, 1993;
- Phase III Feasibility Study Report by ICF, dated July 22, 1993;
- Buried Drum Investigation Report by ICF, dated February 2, 1990;
- Interim Remedial Measure Report by D'Annuazio Associates in 1986;
- NJDEP's "Technical Guidance for Final Covers at Sanitary Landfills", Section 4A dated August 1993 (which is intended to serve as an accompaniment to Part 4-A (ii) of the technical manual entitled "Closure and Post-Closure Care and Financial Plans); and
- NJDEP's overall solid waste regulations pertaining to Closure and Post Closure of Sanitary Landfills including N.J.A.C. 7:26-2A, dated June 1, 1987.

In addition to review of the above listed documents, Dames & Moore conducted a site visit on September 7, 1994 to visually observe the current site surface conditions.

This Summary Report addresses the following units:

- The NJDEP proposed Solid Waste Cap design for the PJP Landfill;
- The NJDEP proposed Replacement of the Sip Avenue Ditch (with an alternative form of drainage); and

- The NJDEP proposed Site Fencing (with respect to Edwin L. Siegel's properties).

2.0 THE NJDEP PROPOSED SOLID WASTE CAP FOR THE PJP LANDFILL

2.1 General

Based on the Proposed Plan, the NJDEP is proposing capping the unlined portion of the PJP Landfill (about 47 acres of the overall 87 acre landfill) with a multi-layer, solid waste cap in accordance with the NJDEP Bureau of Landfill Engineering guidance and the New Jersey Solid Waste Regulations regarding the closure of landfills. The proposed solid waste cap would combine several layers of cover materials including clean sand, soil, and an impervious plastic layer such as High Density Polyethylene (HDPE) and/or a clay liner, as well as a top soil layer and vegetation to prevent soil erosion. The total thickness of the entire cap would be about 3.5 feet. (Alternative LF-4; Proposed Plan - PJP Landfill Superfund Site dated August 18, 1994).

2.2 Evaluations/Discussions

We provide the following evaluations/discussions regarding the above described solid waste cap proposed by NJDEP for the uncapped portions of the PJP Landfill:

1. **The NJDEP proposed landfill capping limits inappropriately coincide and are defined by the current property boundaries. Proper and adequate delineation of the landfill should have been performed to define the outer boundaries of the cap.**

   The existing studies do not appear to have established the actual lateral limits of the landfill, nor have the previous studies comprehensively defined the vertical extent and composition of the landfill materials. At the very least, based on the surface features and the topography of the site, it is unlikely that the easterly boundary of the landfilling exactly coincides with the property lines along Routes 1 and 9. The NJDEP should not have selected a preferred remedial plan without proper and adequate delineation of the landfill.

2. **The NJDEP proposed Solid Waste Cap design for the PJP Landfill is not in compliance with the most current NJDEP Bureau of Landfill Engineering Guidance. The NJDEP has not applied its own guidance.**

The NJDEP's August 18, 1994 Proposed Plan states that the design for the proposed cap will follow NJDEP's Bureau of Landfill Engineering guidance and the New Jersey Solid Waste Regulations. The NJDEP's Soil Waste Division, Bureau of Landfill Engineering has recently (August 1993) developed guidance and performance standards concerning the design and construction of a final cover system for sanitary landfills which is based upon the recent (October 9, 1991) United States Environmental Protection Agency's (US EPA) Subtitle "D", Subpart F regulations pertaining to landfill closure[1]. Although the NJDEP has not yet adopted the new Federal Landfill criteria, it has developed the document titled "Technical Guidance for Final Covers at Sanitary Landfills", Section 4A, dated August 1993 (attached to this report as Appendix "A"), which is in conformance with the new EPA regulations.

The above new guidance and performance standards as they pertain to the PJP Landfill are presented below:

A. *The permeability of the final cover system shall be less than or equal to that of the bottom liner system or natural subsoils present, or 1 x 10^{-5} cm/sec, whichever is less.*

B. *Where no liner system is present (in-situ soils), a typical final cover for the landfill consists of a minimum infiltration layer of 18 inches of 1 x 10^{-5} cm/sec earthen material, overlain by a minimum of 6 inches of erosion layer.*

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[1] The recent emergence of Subtitle "D" regulations allowing a lower regulatory limit on the landfill cover design has been necessitated due to many significant failures in composite low permeability clay covers installed in recent years. The new USEPA criteria were established under 40 CFR, Parts 257 and 258 - Solid Waste Disposal Facility Criteria.

As previously described, the NJDEP August 18, 1994 Proposed Plan for the PJP Landfill calls for a 3.5 foot thick solid waste cap including an impervious layer consisting of HDPE and/or a clay layer (Alternative LF-4). Since the PJP Landfill does not have a bottom liner or a leachate collection/control system in place, a 3.5 foot thick cap/cover containing an impervious layer is not required by the current regulations and guidance.

It is noted that the existing RI studies by ICF indicate the presence of a semi-confining unit comprising the natural in-situ soils below the landfill (*the subsoils have been reported to have permeabilities ranging from $4x10^{-6}$ cm/sec in the eastern uncapped parts of the site, to $3 x 10^{-8}$ cm/sec measured below the previously capped parts of the landfill).* Based on our review of the existing information, and our knowledge of and experience in the region, it is our opinion that the subsurface soils and their geotechnical characteristics are variable throughout the site which have not been comprehensively defined nor delineated by the existing studies to justify a cap design that is uniform for the entire site. The design, as well as the long-term performance of a cover system for this site is highly dependent (among other conditions including groundwater) on the subsurface soil conditions and their geotechnical characteristics. Without such information, the present design of the cap cannot be technically justified.

3. **The NJDEP Proposed Solid Waste Cap may prove to be an ineffective "barrier" to prevent precipitation infiltration.**

Many recent case studies have indicated that even the most properly installed landfill covers have failed shortly after construction due to freeze/thaw action, and as a result of the continual settlements inherent in a landfill medium. In addition to these concerns which fully apply to the PJP Landfill site, the fill material at this site is underlain by compressible organic peat soils which will undergo further consolidation settlements when subjected to the weight of the proposed 3.5 foot thick cap. The combined settlements of the landfill material and the underlying organic soils will likely lead to the eventual failure of the cap, thereby rendering its function as an impervious "barrier" ineffective.

If the intended function of the proposed cap is to minimize precipitation infiltration through the landfill (an objective not justifiable by the site subsurface and groundwater conditions), this objective will not be accomplished during the active life of the landfill since the long-term integrity of the proposed cap cannot be effectively preserved.

4. **The NJDEP proposed impervious Solid Waste Cap will inhibit expedient natural attenuation since it does not account for the hydrological setting of the landfill medium. A more "pervious" cover would be more beneficial.**

The PJP Landfill site has high groundwater levels which place sizeable parts of the lower materials of the landfill within the upper water table which is in direct contact with the Hackensack River. *(Based on the available studies, the bottom of the landfill is at elevations ranging approximately from elevation -2.0 feet to elevation -7.0 feet Mean Sea Level[2](MSL), whereas the upper water table levels within the landfill range approximately from elevation +4.0 feet to elevation +8.0 feet. In addition, the water levels in the nearby Hackensack River range from elevation -2.1 feet for Mean Low Water to elevation +2.9 feet for Mean High Water; and elevation -6.1 feet for Extreme Low Water to elevation +8.4 feet for Extreme High Water).*

For the above described particular setting of this landfill, a more "pervious", rather than an "impervious" cover, will be more beneficial since infiltration will expedite flushing and attenuation of the landfill leachate. Combined with the tidal effects of the adjacent Hackensack River, the natural attenuation process will be further expedited thereby reducing the active life duration of the landfill.

The above discussion is further enhanced by the following information stated in the ICF Phase III Feasibility Study dated July 22, 1993 (Section 1.3, "Nature and Extent of Contamination") regarding the upper unsaturated parts of the landfill materials:

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[2] All elevations are referenced to the National Geodetic Vertical Datum (Sandy Hook Mean Sea Level of 1929).

- *There were no contaminants found in the surface soil sampling data in exceedance of the current NJDEP non-residential surface soil cleanup criteria; and*

- *There were no contaminants found in the subsurface soil sampling data in exceedance of the current NJDEP subsurface soil cleanup criteria.*

Therefore, contaminant migration through the upper unsaturated landfill materials due to precipitation water infiltration is not expected to worsen current conditions. On the contrary, infiltration is expected to expedite flushing and natural attenuation of contaminants.

5. **The NJDEP proposed 3.5 foot thick Solid Waste Cap may adversely impact the existing structures in the area.**

The weight of the proposed 3.5 foot thick solid waste cap will increase areal loading and cause settlements due to consolidation of the underlying compressible deposits. This can adversely impact existing structures, particularly the piers of the Pulaski Skyway since the anticipated settlements will cause downdrag on the pier foundations resulting from construction of the proposed cap. This factor was not considered by NJDEP in selecting the proposed remedial plan.

6. **The NJDEP proposed 3.5 foot thick Solid Waste Cap with a HDPE and/or clay layer will inhibit development in the area.**

Future land use at the PJP Landfill will be restricted since any construction will damage/impair the integrity of the proposed cap if installed with impervious layers of HDPE and/or clay. Also, any future development of the area would require the removal of the cap within the limits of the structures, roadways, and parking facilities. The NJDEP should have considered future development in selecting the proposed remedial plan.

7. **The cost of the NJDEP proposed Solid Waste Cap is not justified based on risk assessments.**

Based on the previous investigations and risk assessments to date, there is not sufficient evidence of risk to justify the expense of capping with a solid waste cap. The main function of the cap would be to prevent direct contact. Direct contact with surficial landfill material to minimize risk to health by dermal contact or ingestion of surficial soils can also be effectively prevented with a simpler soil cover or an asphalt cover where vehicular traffic is anticipated. As such, cost-effectiveness has not been adequately addressed by NJDEP in selecting the proposed remedial plan.

8. **The NJDEP Proposed Plan is inconsistent with respect to landfill gas management. The Proposed Plan should reflect gas management by monitoring. Gas Management would be better served by the use of a "pervious" cover.**

The NJDEP August 18, 1994 Proposed Plan describes Alternative LF-4 (the NJDEP preferred and proposed remedial plan) with a gas management system that will consist of sampling the existing landfill gas vents during the design phase to determine compliance with the then current regulations. *(The existing 45-acre capped portion of the PJP Landfill contains 49 passive gas vents).* If it is determined that the air emissions are not in compliance, then appropriate measures will be taken for the landfill gas management.

The above proposal for gas management by monitoring contradicts with Section XIII "Summary of the Preferred Alternative" in the same Proposed Plan, where Alternative LF-4 is described to involve a passive or active venting system in the new portion of the cap.

Based on our evaluations, gas management by monitoring of the existing vents appears to be prudent since the existing studies do not indicate substantial gas emissions in the uncapped parts of the landfill to warrant a gas venting system.

Therefore, it is recommended that the Proposed Plan reflect the proposal of gas management by monitoring.

Capping the landfill with an impervious cover will restrict the vertical migration of the gases through the porous landfill material and force the gaseous compounds to migrate laterally. Use of a "pervious" landfill cover can allow a more uniform and non-concentrated vertical migration of landfill gases, whereas an "impervious" landfill cover will result in lateral migration and concentrated gas emissions around the perimeter of the landfill including the eastern boundary along Routes 1 and 9, and the adjacent populated areas.

Also, as stated in the ICF Phase II Feasibility Report of May 26, 1993, Section 1.3.2.:

- *At low tide, the gases around the perimeter of the landfill may migrate toward the river and ditch, but the high tides may obstruct the lateral flow of gases and cause the release of elevated levels of volatile organic compounds at the perimeter vents.*

Based on the above discussions, and since the existing studies do not indicate substantial gas emissions in the uncapped portions of the landfill, using a more "pervious" rather than an "impervious" cap will alleviate the need for landfill gas collection/treatment system. Monitoring of the existing gas vents may be continued on a regular basis to determine gas quantities and nature of gas emissions to evaluate the need for a venting system.

3.0 THE NJDEP PROPOSED REPLACEMENT OF THE SIP AVENUE DITCH

3.1 General

The Sip Avenue Ditch is a natural drainage feature of the area which has pre-existed the landfilling activities.

The Sip Avenue Ditch has drained large sections of western Jersey City for centuries. Jersey City has had (and large portions still exist) a combined storm and sanitary sewer system.

The water flow through the portion of the Sip Avenue Ditch which connects the Hackensack River to interior sections of Jersey City east of Route 1 & 9, is tidal. On September 7, 1994 at approximately 14:30 hours, water in the ditch was observed at the Sip Avenue Culvert on Route 1 & 9 to be flowing east, into Jersey City.

The NJDEP Proposed Plan envisions (as estimated in the Phase III Feasibility Study) enclosing the Sip Avenue drainage ditch in a 15 foot diameter concrete culvert. This culvert is estimated to be approximately 2,400 feet in length. To construct a culvert of this size (or smaller), the culvert will have to be properly supported along its entire length. This will require either granular bedding material on the order of 2 to 4 feet in thickness, or more likely, a pile supported relieving platform constructed below and supporting the culvert. As the invert (interior bottom) of the culvert will be at the approximate current stream bed level, the existing sediments along the stream bed will have to be removed to allow construction of the culvert support system (either granular fill if the subsoils are structurally competent or a pile supported relieving platform if the subsoils are soft and/or compressible).

3.2 Discussions/Evaluations

1. If the sediments will have to be removed to construct the culvert, then there does not appear to be any purpose in constructing the culvert itself. It is our opinion that sediment removal alone will accomplish the intended objective of protecting trespassing children and others from dermal contact and ingestion.

2. To attribute the origination of any or all of the contamination found in the Sip Avenue Ditch sediments to the PJP Landfill or surrounding abutting properties west of Route 1 & 9 is unfounded.

   It is a certainty that sediments in the Ditch have been transported to this location by water flows originating from the storm/sanitary sewer system of Jersey City and the Hackensack River since times predating the landfilling activities through the present. In addition, the petroleum hydrocarbons detected in the Ditch sediments have many originating sources from off-site.

3. The size of the proposed culvert (15 foot diameter concrete pipe) is hydraulically incorrect and grossly oversized. No hydrologic/hydraulic study has been done. The estimate of culvert size contained in the Phase III analysis has no engineering basis.

4. The use of an enclosed culvert for this drainage feature is not required to prevent contact with the Ditch sediments. This can be accomplished by relatively minor amounts of dredging of the sediments with appropriate disposal or lining of the ditch channel to the elevations of concern with a geotextile fabric overlain by an approximately 8 inch thick rock filled gabion mattress.

   The dredging of sediments or covering of sediments with gabion mattresses will preserve habitat along the ditch banks for water fowl.

5. The quality of the sediments in the ditch within the limits of the subject area have not been compared to the background quality of sediments upstream (inland) or sediments within the Hackensack River. The questions as to the origin of contaminants found in the ditch have not been answered and therefore responsible parties are not identified.

4.0 THE NJDEP PROPOSED SITE FENCING

The NJDEP Proposed Plan includes full site fencing for the entire 87-acre site allegedly encompassing the PJP Landfill site (See Figure 2-1, from ICF Phase III Feasibility Study Report dated July 22, 1993, attached herewith). This should be reviewed with respect to the current site uses and fencing should be designed such that it does not interfere with the use of the properties by their respective owners. In particular, fencing (and capping) of currently occupied buildings and paved areas to the north of the Sip Avenue Ditch along Routes 1 & 9 is not justified. This is supported by NJDEP's decision to not fence (or cap) the property occupied by Hartz Mountain.

FIGURES

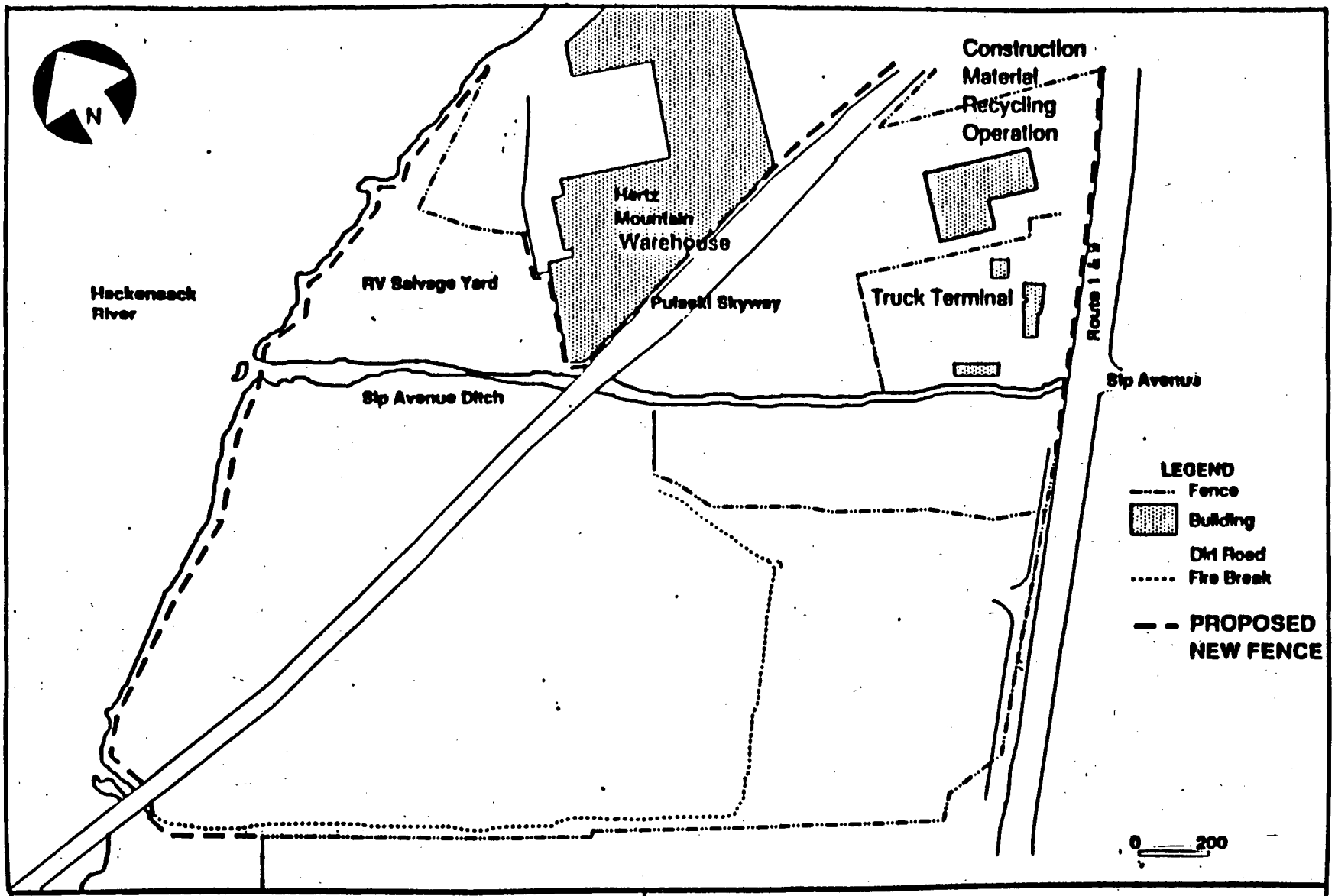

Figure 2-1
Proposed New Fence
(PHASE III FS, JULY 22, 1998)

PJP LANDFILL, JERSEY CITY, NEW JERSEY

ICF TECHNOLOGY, INC

APPENDIX A

APPENDIX A

"TECHNICAL GUIDANCE FOR FINAL COVERS AT SANITARY LANDFILLS"

NJDEP, DIVISION OF SOLID WASTE
BUREAU OF LANDFILL ENGINEERING
AUGUST, 1993

SECTION FOUR (A)

TECHNICAL GUIDANCE FOR FINAL COVERS AT SANITARY LANDFILLS

Section 4A

Technical Guidance for Final Covers at Sanitary Landfills

1. Introduction

This manual provides guidance on the design and construction of final cover systems for sanitary landfills. This section is intended to serve as an accompaniment to Part 4-A (ii) of the technical manual entitled "Closure and Post-Closure Care and Financial Plans".

2. Applicable Regulations

On October 9, 1991, new criteria for municipal solid waste (MSW) landfills were established (40 CFR Parts 257 and 258 Solid Waste Disposal Facility Criteria) by the United States Environmental Protection Agency (USEPA) which included the minimum closure and post-closure requirements. While the Department has not yet adopted these new Federal landfill criteria in its solid waste regulations, the Department has developed guidance and performance standards concerning the design and construction of a final cover system in conformance with the USEPA solid waste disposal facility criteria.

The Department acknowledges that other final cover designs may be acceptable, depending upon site-specific conditions and a determination by the Department that an alternative design satisfies the regulatory requirements. It is the responsibility of the facility owner or operator to prove that the alternative design will provide a level of performance that is at least equivalent to that of the final cover system described in this manual.

3. Policies and Regulatory Interpretations

(A) A final cover system shall comply with the following performance standards:

1. The permeability of the final cover shall be less than or equal to that of the bottom liner system or natural subsoils present, or 1 x 10^{-5} cm/s, whichever is less.

2. If the landfill has a synthetic membrane in the bottom liner system, then the infiltration layer in the final cover shall include a synthetic membrane as part of the final cover. However, the synthetic membrane of the final cover does not have to be the same type or thickness as the membrane in the bottom liner system.

3. If a synthetic membrane needs to be included in the final cover, a minimum thickness of 30 mils shall be used. In the case of High Density Polyethylene (HDPE), a minimum

thickness of 60 mils is required to ensure proper seaming of the synthetic membrane.

4. For sanitary landfills permitted to receive only I.D. 13 (bulky waste) and no other waste types, the rules and policy governing the infiltration layer in this technical manual may not apply.

(B) The following requirements are typical designs of sanitary landfills and their corresponding final cover requirements.

	Municipal Solid Waste Landfill Design	Minimum Final Cover
i)	no liner (in-situ soils)	minimum infiltration layer of 18 inches of 1 x 10^{-5} cm/s earthen material overlain by a minimum of a 6 inch erosion layer
ii)	recompacted 1 x 10^{-6} cm/s soil liner	minimum infiltration layer of 18 inches of 1 x 10^{-6} cm/s earthen material overlain by a minimum of a 6 inch erosion layer
iii)	composite liner (80 mil synthetic over 3 feet of recompacted 1 x 10^{-7} cm/s soil liner)	the infiltration layer must contain a synthetic membrane

The above illustrations are minimum final cover requirements for a sanitary landfill. Part C below describes in detail the design and construction requirements for a multi-layer final cover system.

(C) The cover system presented herein is a multi-layer design consisting of a vegetative layer, a drainage layer, an impermeable cap and a gas venting layer. This section describes the design details for each component of the final cover and considerations for construction quality assurance. The design of the final cover system is dependent upon site-specific conditions including local precipitation, construction materials, freeze-thaw phenomena, waste characteristics, potential subsidence and other environmental factors.

A capping system consisting of a vegetative layer, a drainage layer, an impermeable cap and a gas venting layer shall be designed and constructed in accordance with the following:

1. The capping system shall minimize long term infiltration and percolation of liquids into the sanitary landfill throughout the post-closure

period.

2. The capping system, in conjunction with the containment system, shall completely isolate the landfilled solid waste from the surrounding environment.

3. The long term stability of the final slopes shall be determined by modeling techniques in conjunction with the information gathered pursuant to N.J.A.C. 7:26-2A.5(a)6 and 7(b)3, and the factor of safety shall be within the minimum values set by Table II in N.J.A.C. 7:26-2A.7(b)3i.

4. The grades of the final slope shall be constructed in accordance with the following standards:

   i. The top slope final grades, after allowing for settlement and subsidence, shall be, at a minimum, three percent;

   ii. Top slope final grades should be, at a maximum, five percent. Steeper top slopes which will promote drainage and not subject the closed sanitary landfill to excessive erosion will be permitted provided the maximum erosion rate does not exceed two tons per acre as determined by the United States Department of Agriculture, Universal Soil Loss Equation;

   iii. The side slopes of the final grades shall be no steeper than three horizontal to one vertical (3:1).

5. The final grades of the capping system shall have a surface drainage system, designed and constructed in accordance with the requirements of N.J.A.C. 7:26-2A.7(g), capable of conducting run-off across the final grades without the development of erosion rills or gullies.

6. The construction of the capping system should accommodate initial settlement so that the integrity of the impermeable layer is maintained throughout the closure and post-closure period. A temporary cover may be allowed, provided the leachate collection system is operating properly, in accordance with the following:

   i. The temporary cover should be capable of minimizing infiltration into the sanitary landfill;

   ii. The thickness shall be a minimum of 12

compacted inches and temporary stabilization methods shall be employed to prevent erosion and exposure of solid waste.

7. The impermeable cap shall be designed and constructed in accordance with the following:

   i. The cap shall, at a minimum, be as impermeable as the most impermeable component of the containment system;

   ii. The minimum thickness for a clay impermeable cap shall be 12 inches;

   iii. The minimum thickness for a geomembrane impermeable cap shall be 30 mils. If High Density Polyethylene, 60 mils;

   iv. The impermeable cap shall be constructed and tested in accordance with N.J.A.C. 7:26-2A.7(c), except that 2A.7(c)2vii, viii, and ix does not apply;

   v. Geomembranes utilized as an impermeable cap shall be designed and constructed to withstand the calculated tensile forces acting on the geosynthetic materials. The design shall consider the maximum friction angle of the geomembrane with regard to any interface and shall ensure that overall long-term slope stability and erosion control of the final cover system is maintained;

   vi. The geomembrane shall be protected from below by a minimum of six inches of bedding and above by a minimum of twelve inches of cover which is no coarser than a poorly graded sand (SP), as determined in the Unified Soil Classification System (USCS), and which is free of rocks, fractured stones, debris, cobbles and solid waste. An equivalent geotextile may be utilized as approved by the Department;

   vii. The impermeable cap shall be located wholly below the average depth of frost penetration as determined by United States Department of Agriculture (USDA) mapping. Please contact the Bureau of Landfill Engineering or the local Soil Conservation District for information and/or copies of USDA frost penetration mapping.

8. A drainage layer shall be designed and constructed in accordance with the following:

i. The design testing of materials and the quality control testing of the drainage layer of the capping system shall be performed in accordance with N.J.A.C. 7:26-2A.7(d)2ii, vii and viii;

ii. The material utilized in the drainage layer shall be an open graded material of clean aggregate. The material should be in accordance with the following criteria of the cumulative grain size distribution curves:

(1) $D_{85}<4D_{15}$; and,
(2) $D_2<0.1$ inch.

iii. The drainage layer shall be designed and constructed so that the discharge flows freely in the lateral direction, to minimize the hydrostatic head on the impermeable cap, through the drainage layer, and provides a path for infiltrated liquids to exit the capping system;

iv. The drainage layer shall have a thickness and hydraulic conductivity capable of transmitting the estimated percolation, based on modeling of the system. The latest version of the Hydrologic Evaluation of Landfill Performance (HELP) model shall be used to facilitate rapid estimations of surface run-off, subsurface drainage and leachate generation quantities. The drainage layer shall be constructed, at a minimum, in accordance with the following:

(1) When located above a clay impermeable cap, the drainage layer shall be, at a minimum, six inches thick;

(2) When located above a geomembrane impermeable cap, the drainage layer shall be, at a minimum, 12 inches thick.

v. Drainage pipes and/or geonets, where necessary to control the hydrostatic head on the impermeable cap, should be located within the drainage layers in accordance with the following:

(1) The drainage pipe should be installed at a distance sufficient to ensure that the hydrostatic head on the impermeable layer does not exceed the thickness of the drainage layer during a 25 year, 24 hour storm.

(2) A coarse gravel envelope within a geotextile fabric, shall be installed in accordance with N.J.A.C. 7:26-2A.7(d)3ix around the drainage pipe to minimize the movement of soil particles in the drainage pipe.

vi. A soil filter or geotextile should be designed and constructed above the open graded aggregate in order to minimize the intrusion of fines into the drainage layer.

9. The vegetative layer shall be designed and constructed in accordance with the following:

i. The vegetative layer shall be thick enough to contain the effective root depth or irrigation depth for the type of vegetation planted;

ii. Fertilizer, lime, mulch, and seeding applications shall be performed in accordance with the Standards for Soil Erosion and Sediment Control for permanent vegetative cover for soil stabilization;

iii. The minimum thickness of uncompacted topsoil in the upper layer of the vegetative layer shall be five inches. The topsoil shall meet the Topsoil Standard specified in Section 909.10 from the NJDOT Standard Specifications for Road and Bridge Construction.

iv. The application of sludge or the use of Sludge Derived Product (SDP) to the final grades of the vegetative layer shall be performed in accordance with the New Jersey Pollutant Discharge Elimination System regulations, N.J.A.C. 7:14A.

10. A gas venting layer shall be located directly below the impermeable layer and above the compacted waste layer. Such a layer shall be designed and constructed in accordance with the requirements set forth at N.J.A.C. 7:26-2A.7(f).

PJP LANDFILL
COMMENTS TO PROPOSED PLAN
DATED AUGUST 18, 1994

1.0 Introduction

The following present Coopers & Lybrand's general discussions and comments to the "Proposed Plan - PJP Landfill Superfund Site", dated August 18, 1994. Our comments are prepared on behalf of our client, Edwin Siegel. We understand that these written comments will be included in the Responsiveness Summary section of the Record of Decision (ROD) which will formalize the selection of the remedy.

In the course of our work, we conducted the following research:

- Read certain documents related to the Proposed Plan issued by New Jersey Department of Environmental Protection ("NJDEP") for the environmental remediation of the PJP Landfill in Jersey City, New Jersey, including:
    - Proposed Plan for the PJP Landfill prepared by NJDEP ("the Proposed Plan"), dated August 18, 1994
    - NJDEP Final Report on Interim Remedial Measure by D'Annunzio Associates Inc., undated
    - Phase III Feasibility Study for PJP Landfill by ICF Technology Incorporated, dated July 22, 1993
    - General Comments to the NJDEP Proposed Plan by Dames & Moore
    - General Comments to the NJDEP Proposed Plan by McLaren/Hart

- Conducted an inspection of the Site and the surrounding areas to ascertain the existing and potential nature of development.

- Performed a highest and best use analysis, (Attachment A), to determine a reasonable expected future use of the property and an expected income potential per square foot for that future use.

- Considered the sensitivity of the rate of return on the property to incremental development costs.

2.0 General Future Use Comments

Contaminated property recycling utilizes a cooperative approach between legal, technical, financial and regulatory communities to facilitate and allow development of properties currently abandoned or underutilized due to the contamination stigma to an appropriate and higher utilization. The benefits of this approach include increasing the tax base, and job creation for the municipality and improved financial performance for current owners and investors. These goals are consistent with the stated goals of the Jersey City 1984 Master Plan for development (See Attachment A.)

Environmental remediation specialists are observing a wide range of land uses for reclaimed sites, depending on the degree and type of previous contamination and the subsequent cleanup or containment. Ideally, the issues of hazard would be addressed in cleanup so that the economic viability of the site would be maintained and would thereafter depend on the relative market factors alone.

Examples of successful contaminated property recycling efforts include:

Developer Peter Aagard is currently building a 200 store outlet mall on a 166-acre former landfill in Elizabeth, New Jersey. U.S. banks rarely extend credit on properties that are environmentally tainted, Aagard is not using domestic financing to acquire and clean up the site. His total cost is expected to be one-half of the amount he would expect to pay for a comparable and environmentally clean site, and this cost savings is a fundamental motivation of his decision to proceed with the project. Ikea USA Inc. built a store over a former landfill in Elizabeth in 1990. Representatives in the City of Elizabeth indicated that the Ikea development has been so successful that Ikea has planned another 400,000 square feet of speculative development on the site. Both the Ikea site and Aagard's development have realized success because of their superior locations and the support of state and local economic development officials.

Virginia Beach, Virginia, affected a reuse of a former trash landfill, turning the area into a park and recreation area. The 125-acre landfill was created over a period of fifteen years, then capped with a layer of sand and clay before it was landscaped and transformed into a recreation area which has a daily attendance of as many as 8,000 people. The park opened in 1976 as Mt. Trashmore Park, in ongoing recognition of the success of the reuse of the site. Virginia Beach is currently in the process of reclaiming another landfill which will be converted for reuse within the next decade.

A retail shopping center in Syracuse, New York, was developed in 1992 over a former landfill that had been a dumping site for over a century. The site had formerly been on the outskirts of the City; over time development surrounded it, so that ultimately the site was centered in the midst of development with excellent visibility and access to transportation arteries. These location factors were critical to the success of this project.

3.0 Highest and Best Use Analysis

Attachment A provides a highest and best use analysis prepared to support our analysis of potential future uses for the site. It indicates that the expected future use of the property would be for light industrial or possibly an office or research and development facility, in accordance with the applicable zoning regulations. For the purpose of evaluating the sensitivity of future use development economics to the selected remedial alternative. The future use of an industrial warehouse facility was utilized. Rental rates for this type of use are expected to be about $3.50 per square foot of building developed. The maximum building coverage allowed under current zoning is 45%. This information was utilized to evaluate the returns on investment which are required to determine if future development is economically feasible.

4.0 Expected Return on Investment Analysis

Maximum Development Potential

Zoning I-3, Industrial Park, permits 45% maximum building coverage of the site. Assuming a best case scenario, the site could accommodate construction of structures totaling 1.7 million square feet of building space. Given the average industrial warehouse rental rate in the area of $3.50 per square foot (triple net). This represents a potential annual net rental income to the developer of approximately $6 million.

Development Costs As If Clean

An "average class C" industrial warehouse building constructed on a green field site in this area would cost $33.32 per total rentable square foot, according to Marshall Valuation Service for April, 1994. In addition, parking space that would accommodate one space for each 200 square feet of interior space would add $4.12 per square foot, for a total of $37.44, inclusive of all but land and site preparation.

If developed to its maximum potential of 1.7 million square feet, these per square foot costs translate into a development cost of $63.6 million before land and site preparation costs.

Return on Investment

The relationship between rental rates, construction costs and return on investment required to attract future tenants, developers and financial investors is well understood. One customary measure used to illustrate the relationship between these factors is the "capitalization rate". This measure relates income of the property to the investment in the property.

According to the real estate investor survey published by Korpacz, the current range of desired capitalization rates is 7.25% to 12% for new development of class C industrial property.

5.0 Preferred Remedy Impact On Future Use Development

As stated above, the costs to construct an industrial warehouse facility is not inclusive of the costs of site preparation. For development of contaminated property, the selected remedial alternative implemented is the single greatest issue in determining site preparation costs. Generally, the developers, investors etc. use the capitalization rate for a particular property in comparison with their desired return as a basis for evaluating potential future use alternatives. Clearly, additional development costs reduce the capitalization rate for the property, and accordingly, reduce the developer's ability to proceed with a future use. These additional costs may arise because the preferred remediation alternative of capping the property with a NJDEP solid waste cap consisting of layers of sand, soil and an impervious layer, does not consider such factors as the caps ability to bear the load of building foundations, site topography and drainage patterns, and regrading and possible redesign and replacement of portions of the cap included in development. These are significant costs and may eliminate the potential for future productive use. Accordingly, the impact of additional development costs, occassioned by the preferred remediation alternative must be carefully considered as they will reduce the capitalization rate for the property.

Implementing the NJDEP selected remedial alternative will increase the expected site preparation costs and related cost to construct and thus significantly impair or eliminate the developers ability to feasibly develop the property. This occurs because the rate of return which can be potentially earned from the site is very sensitive to the incremental costs incurred to rework the preferred remediation alternative if its design and implementation do not consider expected future use. Although the warehouse buildings, and related parking effectively replace the impaired cap beneath the developed areas, all remaining capped areas will require regrading and possible redesign and replacement at additional costs beyond the ability of the project. The selected remedy should include considerations of future development requirements to mitigate the expected site preparation costs and allow for feasible future use of the site.

6.0 Conclusions

The proposed plan for remediation of the PJP Landfill Superfund Site should not be implemented as currently described. The feasibility study analysis of remedial alternatives should anticipate the future development requirements of the site. This approach prevents the creation of additional condemned real property and the accompanying stigma to the surrounding community. Additional potential benefits to the community in the form of tax ratables and employment make this former landfill site an excellent candidate for contaminated property recycling.

Coopers & Lybrand L.L.P.

Coopers & Lybrand L.L.P.

ATTACHMENT A

SCOPE OF SERVICES

We have prepared preliminary observations regarding the potential future uses, after remediation, of the PJP Landfill (the "Site") located in Jersey City, New Jersey.

In the course of our work, we conducted the following research:

- Read certain documents related to the Proposed Plan issued by New Jersey Department of Environmental Protection ("NJDEP") for the environmental remediation of the PJP Landfill in Jersey City, New Jersey, including:
    - Proposed Plan for the PJP Landfill prepared by NJDEP ("the Proposed Plan"), dated August 18, 1994
    - *NJDEP Final Report on Interim Remedial Measure by D'Annunzio Associates* Inc., undated
    - Phase III Feasibility Study for PJP Landfill by ICF Technology Incorporated, dated July 22, 1993
    - General Comments to the NJDEP Proposed Plan by Dames & Moore, General Comments to the NJDEP Proposed Plan by McLaren/Hart
- Interviewed representatives of local Planning and Zoning departments to determine the long term plans for the area in which the landfill is located. In addition, we read local planning documents including:
    - Master Plan for the City of Jersey City, dated 1966, with updates of 1984 and 1992
    - Zoning Ordinance adopted 1974 and amended in 1993
    - Jersey City Ward Profiles, 1989, Ward B Study
    - Development Projects, 1984 to present
- Conducted an inspection of the Site and the surrounding areas to ascertain the existing and potential nature of development.
- Compiled economic, demographic and development trends for the area from several sources, including the City of Jersey City, New Jersey, Claritas (a national demographic database), The WEFA Group (a national economic forecasting group) and the Urban Land Institute.

- Interviewed operators of businesses located on or near the Site to ascertain their impressions of the area and its development potential.

- Interviewed selected real estate professionals who have been involved in industrial and warehouse site transactions in Jersey City and the Hudson County area to ascertain a range of land values for the potential land uses.

- Interviewed environmental mediation specialists, who have arbitrated issues relating to contaminated site cleanups, to determine trends in environmental remediation and reuse of environmentally impacted sites.

SUMMARY OF FINDINGS

Description of the Site and Surrounding Area

The Site is an inactive landfill located in an industrial section in the western part of Jersey City, New Jersey. It comprises approximately 87 acres of land area. The topography was irregular and it appeared that significant grading would be required on portions of the property prior to any development.

The Site is bounded by the Hackensack River, Hackensack Avenue, Route 1/9 and the Pulaski Skyway. Route 1/9 is a major thoroughfare running in a north-south direction and providing access across the Hackensack River to "mainland" New Jersey via Newark. The roadway provides access to the Holland Tunnel and New York in the northern direction. As a result, the thoroughfare serves as a major trucking and distribution artery.

The Pulaski Skyway is an elevated highway which passes over the northwest corner of the Site. Elevated rail lines for Amtrak and PATH commuter rail are visible beyond the Skyway. In fact, in this general area there are multiple elevated highways and, thus, very little development underneath the road network. Given the road network, the site is easily accessible and very visible.

There are several commercial establishments on the site, including a small truck stop, a recycling transfer and warehouse facility, and other small warehouse uses.

Land uses in the immediate area are primarily warehouse or transfer point in nature, including the Hartz Warehouse facility, a carpet warehouse, an auto auction, a trash separation/recycling facility and a cemetery. A Zoning officer indicated that the most recent land use in the area is the auto auction. The recycling separation and transfer facilities began operations within the past five to eight years, in response to New Jersey's trash recycling legislation and requirements.

According to the Jersey City Zoning Ordinance, last amended October 1993, the Site is zoned I-3, Industrial Park, with permitted uses of warehousing, shipping, manufacturing, and terminal activities, among others. These permitted uses are consistent with surrounding land uses noted in a survey of the neighborhood. The approved Master Plan of Jersey City, updated in 1992, indicates that the area is designated for industrial, trucking, and warehouse use. The current use is consistent and compatible with the local jurisdiction's Zoning Ordinance and Master Plan.

Economic and Demographic Trends

Population and Households

Jersey City is one of the largest cities in the State of New Jersey. Its current estimated population is 230,000. The City realized a substantive net outmigration between 1970 to 1980 of 14 percent. This exodus was in keeping with the trend of outmigration and deindustrialization in northeastern urban areas during this period. Jersey City and Hudson County lost several major employers during this period, including Colgate, American Can Company and Maxwell House. Between 1980 and 1990, there was a slight rebound as the population increased from 223,500 to 228,500, representing a 2.2 percent growth rate. Since the 1990 Census, it is estimated that population has remained stable, increasing only by 0.3 percent over the period, to its present level of 230,000. Claritas projects that the population will increase slightly through 1999, at which time the population is estimated to be 232,000.

In terms of age distribution, approximately twenty percent of the population in 1990 was school age, i.e. 5 to 19 years old sector of the population witnessed an 18 percent decline from 56,000 to 46,000 during the period of 1980 to 1990. Seventy-five (75) percent of the population was considered working age, 18 or older. (There is an overlap between these two groups)

Approximately one-half (48 percent) of the population in 1990 was white, with 30 percent African-American and 11 percent Asian. The white sector of the population declined from 127,000 to 111,000 during the period (a 15 percent decrease), the black sector increased slightly from 62,000 to 68,000 (a 10 percent increase) and the Asian sector increased from 9,800 to 26,000, (an increase of 260 percent).

The number of households in the City increased slightly from 80,700 in 1980 to 82,400 in 1990, an overall increase of 2.1 percent. Currently, there are an estimated 82,500 households, an increase of 0.2 percent since the beginning of the decade. By the year 2000, Claritas estimates that there will be 83,600 households in the City, representing a slight increase of 1.2 percent over the current level.

Income (Current Dollars)

The population realized appreciable gains in income over the period 1980 to 1990. Per capita income in Jersey City was $5,811 in 1979, increasing 123 percent to $12,982 in 1989. After

accounting for the effects of inflation this represents a 24 percent real increase in income over the period. Current per capita income is estimated by Claritas to be $15,256, a 17.5 percent increase over the 1990 Census figure. After adjusting for the effects of inflation, this number has remained essentially unchanged over the period from 1989 to the present. The City is projected to experience a 20.1 percent growth in per capita income to 1999.

The 1990 Census data indicated that 19 percent of the population earns income below the poverty level.

Employment

Total unemployment in Jersey City increased by 18 percent over the period from 1980 to 1990, from 88,000 to 105,000. This decline is directly related to a shift from manufacturing to financial services. Unemployment ranged from currently 10 percent in 1980 to 11 percent in 1990, as the region's economy witnessed some displacement and restructuring due to the economic reorientation. Currently, the unemployment rate is 10 percent.

Approximately 56 percent of the civilian workers are employed in service industries composed of finance, insurance, real estate, transportation, communication and other public utilities. Another 20 percent are employed in either the wholesale or retail local industries. Approximately 74 percent of all workers are in some type of service occupation, as either management, technical support or sales positions. In 1990, 48 percent of the workers commuted less than 29 minutes to work.

The industrial and manufacturing employment sector in the Northern New Jersey region witnessed a decline of 170,000 jobs, or 26 percent from 1980 to 1990.

The above data appear to indicate that while the City has experienced a significant population decline during the later part of this Century, it has remained stable in the past several years. This stability is expected to continue into the near future.

<u>Development Sectors</u>

Following is a discussion of recent development trends among different product types within the Northern New Jersey region:

Housing

Residential building permits in the Northern New Jersey region (comprised of Bergen, Essex, Hudson, Mercer, Middlesex, Monmouth, Morris, Passaic, Sommerset and Union Counties), reached a high of 33,000 in 1985. The sector has witnessed a sharp decline from 1986 to an estimated level of 15,000 to 20,000 annual permits throughout the 1990's.

In Jersey City the number of housing units has remained stable at approximately 90,000 units over the period of 1980 to 1990, and is expected to remain stable throughout the remainder of the decade.

Within the greater metropolitan area the housing stock has also remained stable, at roughly 208,000 units. The average housing value has declined from a peak of $121,000 in 1988 to an estimated $111,000 in 1994. Approximately 26 percent of the housing stock is owner occupied, while 64 percent is renter occupied, and the remaining 10 percent of the housing stock is vacant. Only 13 percent of the housing stock is single-family units, with 42 percent of the housing stock in 2- to 4- unit buildings; the remaining in larger buildings containing 5 or more units.

Commercial

According to data from WEFA, the value of Commercial office construction in Jersey City peaked at an annual amount of $170 million in 1987, declining to $90 million by 1990. Value of construction in this sector remained at less than $10 million annually through 1993, but is expected to be in excess of $25 million for 1994 and is projected to exceed $20 million per year through 2000. The level of construction in this sector is consistent with economic and demographic trends in the market. The Director of the Economic Development Council indicated that Hudson County has been very successful in recruiting office users in recent years, and that the County has been the overwhelming choice for companies locating and relocating to the State of New Jersey. Financial Services companies including Banker's Trust, First Chicago, and Brown Brothers have in recent years relocated back office operations to the Hudson River waterfront in Jersey City. The PATH commuter train station located at Pavonia, along the water front, provides easy access to Manhattan, and has fueled this back office expansion.

Office space in the Northern New Jersey region reportedly has realized average annual absorption of 3.1 million square feet during the period 1990 through 1993, with an average vacancy rate of approximately 20 percent. Average annual rents per square foot were $24.00 during the same period.

Industrial

Real Estate and Construction Services data prepared by The WEFA Group, dated Spring 1994, reflect a large slowdown in industrial development in Jersey City over the period from 1984 to the present. The value of industrial buildings put in place in the City in 1985 was $37.2 million, compared to only $1.3 million in 1994 (1987 dollars). Given the value of construction permits pending, the industrial sector is projected to experience further decline over the next decade to new construction value of less than $1 million annually.

Absorption of industrial/warehouse space in the Northern New Jersey regional market has averaged 750,000 square feet annually for the period 1990 to 1993, with an average vacancy rate of 13 percent. Average annual rental rates were $3.50 per square foot, gross, over the period.

Development Potential of the Site

While the text of the 1984 Master Plan discussed the City's goal of enhancing infrastructure to further promote the industrial development sector, the Director of City Planning indicated that there has been very little industrial development over the past decade. A review of the Planning Department's master list of completed, approved, and proposed developments for the City of Jersey City confirmed that there has been no industrial development during this period. In fact, much of the industrial space along the east side of the City has been converted to higher commercial or residential uses.

The Planning Director indicated that Jersey City's planning resources have been directed to recruit office users into the area. The City's emphasis has been job and tax base creation, and it reportedly has realized greater returns in its' recruitment of office users than it would have realized from industrial or warehouse users.

The State of New Jersey reportedly incurred over $20 million in expenses for the interim, partial clean-up of the Site in the mid-to late-1980's. This interim clean-up included the removal of drums that were leaking chemicals, extinguishing topical and underground fires, and the construction of a temporary cap on part of the property. However, real estate professionals who specialize in industrial warehouse product in the Northern New Jersey market indicate that there continues to be a negative perception in the market because of the fires on the Site in the 1980's.

The Site's access to the Holland Tunnel is deemed its most marketable attribute, according to the commercial real estate professionals we interviewed. The intrinsic value of the Site's location has also been highlighted by Economic Development agencies in the region. In the early 1990's, the City's Housing and Economic Development Office proposed to the New Jersey Department of Environmental Protection that a 200 foot deep frontage of the Site along Route 1/9 be released for development of retail and wholesale distribution, but the plan was never approved and the project was not undertaken.

Although a visual survey did not reveal comparable sites in the area being marketed for lease or sale, one broker interviewed noted that there was a former trucking terminal (occupying a 3 to 4 acre site) in close proximity to the subject, which has been marketed for sale for several years. He was not aware of the asking price and could not provide information on who was marketing the property. He also indicated that in general, industrial and warehouse space is perceived to be in decline by the real estate community due to the absorption of space in the Region. Potentially this could bode well for the Site, for as industrial space is absorbed in other areas, Jersey City will still have a supply of available space. The industrial product in Jersey City is commanding $3 to $4 per square feet, gross, with properties along the Hudson River earning a premium of $0.50 per square foot.

Development Regulations and Limitations

Because the site is a Superfund site, any development will be subject to review and approval by the New Jersey Department of Environmental Protection, and the United States Environmental Protection Agency. Beyond these restrictions, development of the site is limited by the local zoning restrictions.

Future Use Impact On Remedial Plan

Under New Jersey's Industrial Site Recovery Act ("ISRA"), the application of cleanup standards may account for current, planned or potential use of the property being remediated. See Section 35, N.J.S.A. 58:10B-12(C)(2). This is consistent with a trend in legislation relating to environmental remediation that requires involved parties to consider and evaluate the potential for future economic use of remediated sites. Michigan Environmental Response Act, Michigan Public Law 307, specifically requires that future uses be considered in environmental cleanups. The United States Federal Superfund regulations often call for severely polluted sites to be cleaned to a standard suitable for residential and recreational uses that would allow human contact with the soil. It is widely maintained among environmental professionals that the reauthorization of the Superfund legislation will impose a less stringent standard for remediation of industrial and commercial sites, and encourage the consideration of future use of the site when selecting a remedial alternative. A legislative change of this nature could directly impact the ability to redevelop the PJP Landfill for economical uses.

NJDEP did not make any account for future use of the property in determining the appropriate remedy. NJDEP has proposed a remedial plan for the property with corresponding costs estimated to be $22 million. Development may impact the integrity of the cap and will, therefore, be subject to approval by NJDEP and EPA. Within this context, there will be costs associated with future development beyond typical development costs. These costs include: engineering and legal expenses associated with the reviews and approvals by the environmental agencies;

construction costs related to grading; or, costs related to restoration of portions of the cap that would be negatively impacted by any proposed construction activity.

CONCLUSION

Based upon the analysis of the Site and surrounding area, current and expected economic and demographic trends, land use development trends, and discussions with local public officials, real estate brokers and other business people knowledgeable about the Site and the area; and discussions with selected environmental remediation specialists; the highest and best use of the site, is for light industrial or possibly an office or research and development facility, in accordance with the applicable zoning regulations.

CONDITIONS OF OUR WORK

This report is based on our knowledge of the real estate industry, meetings with representatives of client and interviews with representatives of various public agencies and local real estate firms during which we were provided certain information. Where appropriate, the sources of the information are stated herein. The information provided to us was not subject to audit examination or other verification procedures.

Coopers & Lybrand makes no representation or warranty as to the accuracy or completeness of the information contained within our report obtained by others, including any estimates, and shall have no liability for any representations (expressed or implied) contained in, or for any omissions from, our report.

The information and analysis provided in this report are intended solely for use in connection with the submission of comments to the PJP Proposed Plan and should not be relied upon for any other purpose. Our report, or any reference to our Firm, may not be included or quoted in any offering circular or registration statement, prospectus, sales brochure, appraisal, loan or other agreement.

This report is based on assumptions, estimates, and other factors. Some assumptions inevitably will not materialize, and unanticipated events and circumstances will occur; therefore, actual results achieved during the future period covered in our analysis will vary from our estimates, and the variations may be material. In preparing this report we have assumed that legal, engineering, or other professional advice, as may be required, has been obtained from professional sources and that our analyses will not be used for legal or engineering guidance in such matters. It is also assumed that the property will not operate in violation of any applicable government regulations, codes, ordinances or statutes.

This report is based on economic conditions and other factors as of our last day of interviews. We have no responsibility to update our report for economic or market factors occurring after that date.

COMPENSABLE TAKING ISSUES ASSOCIATED WITH NJDEP'S PROPOSED PLAN FOR THE PJP LANDFILL SUPERFUND SITE SUBMITTED ON BEHALF OF EDWIN L. SIEGEL, EDLIN LTD. AND TOOLEY'S ENTERPRISES

Edwin L. Siegel, Edlin Ltd. and Tooley's Enterprises submit the following comments to NJDEP's Proposed Plan for the PJP Landfill Superfund Site ("Proposed Plan").[1] As detailed below, because of the manner in which the Proposed Plan effectively deprives the owners' future use and development of property within the alleged boundaries of the Site, it constitutes a compensable taking under the Fifth Amendment of the United States Constitution.

The Proposed Plan involves, among other components, fencing of the 87-acre area allegedly encompassing the PJP Landfill Site (the "Property"), including barbed wire and warning signs around the perimeter of the entire Site. Additionally, approximately 42-acres will be capped with a multi-layer, impervious solid waste cap with gas venting and a vegetative cover. The other 45-acres were previously capped as part of an Interim Remedial Measure ("IRM"). The existing monitoring wells and air vents will remain on the property and additional air vents may be installed. Access requirements will be imposed for purposes of sampling and monitoring of the wells and vents.

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[1] NJDEP has issued the Proposed Plan as part of its public participation responsibilities under Section 117(a) of the Comprehensive Environmental Response, Compensation and Liability Act ("CERCLA"), as amended, and Section 300.430(f) of the National Contingency Plan ("NCP"). The public comment period, initially due to expire on August 31, 1994, has been extended to October 14, 1994.

The parties submitting these comments are partial owners of the Property. Edwin L. Siegel has title to Block No. 1627.2, Lot 1P; Block No. 1639.2, Lot Nos. 1C and 7; Block No. 1639.1, Lot Nos. 2A, 3 and 4C; and Block No. 1627.1, Lot No. 6A, as shown on the City of Jersey City Tax Map dated October 1977. Edlin Ltd. has title to Block No. 1627.1, Lot Nos. 5A, 3B and 4B. Tooley's Enterprises has title to Block No. 1627.1, Lot No. 2A.

All of the Block and Lot Numbers identified above fall within the Property which is the subject of the Proposed Plan.

Implementation of the Proposed Plan will result in the following: (1) all access to the property will be fenced off; (2) current operating businesses will necessarily be discontinued; (3) any future development prospects of the property will be effectively eliminated since any construction will damage/impair the integrity of the proposed cap; (4) any future development of the property will be effectively prohibited because it will be prohibitively expensive to remove and/or practically impossible to obtain the necessary permits allowing for removal of the existing cap and replacement with an alternative capping material suitable for typical development activities; (5) the property will be permanently burdened with monitoring wells and air vents; and (6) the owners will be required to provide the equivalent of an easement across their property for purposes of access to monitor and sample the wells and vents and for such other future activity the government deems necessary in the future.

The imposition of these regulatory requirements are tantamount to a physical appropriation of the property. The Fifth Amendment of the United States Constitution requires just compensation where private property is taken for a public use.

Physical invasions of property pursuant to a CERCLA investigation/remediation of the nature contemplated by the Proposed Plan clearly constitute compensable takings. The United States Supreme Court in Lucas v. South Carolina Coastal Council,[2] held that such physical invasions, no matter how minute and regardless of the weight of the public interest advanced, require just compensation. In addition, the regulatory requirement for access to one's property, i.e., to monitor and sample wells and air vents, requires just compensation just as the taking of an easement would so require.

The United States Supreme Court in Lucas held that when government regulation deprives the land of all economically beneficial use, a taking has occurred without regard to the public interest advanced. As detailed above, implementation of the Proposed Plan will eliminate all economically beneficial uses of the property - there will be no access to the property, all currently operating businesses will as a result be closed, any future development will be effectively eliminated as any construction will damage/impair the impermeable nature of the cap, and given the prohibitive cost of and virtual impossibility of obtaining permits for the removal of the selected cap in order to replace it with a material suitable for development purposes,

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[2] 112 S.Ct. 2886 (1992)

development will be effectively prohibited. In other words, the entire fee simple interest held in the property will be rendered valueless. This result remains the same regardless of whether all the Block and Lot numbers listed above are treated as one parcel or as separate parcels.

Unquestionably, the property should be put to its best-suited and most beneficial use, namely, industrial use. The property is located along the Hackensack River and Routes 1 and 9. It provides immediate access to the State's major highways, as well as New York City tunnels and rail lines. The surrounding area is primarily industrial. Numerous inquiries have been received from interested developers in the past regarding use of the property for warehousing, shipping, trucking, or other industrial operations. The City of Jersey City has received inquiries regarding development of the property for industrial uses. See Affidavit of Jane Dobson dated September 28, 1994, Para. 5. Moreover, NJDEP has allowed Hartz Mountain to develop and use its property for warehousing operations along the back of the Property.

All of the intended uses of their property are beneficial and not harmful to the public interest. Use of the property for an industrial purpose will create tax revenues which are desperately needed in this depressed urban area. The contemplated activities are suitable in the given location and alternatives to the Proposed Plan have been provided which ensure equal protectiveness of the public health and general welfare, while allowing for future development.

Elimination of the clearly inappropriate fencing of the entire property does not entirely address the legal concerns addressed herein. Even if a comparison of the value of the property after remediation to a developable state as compared to its value after implementation of the Proposed Plan shows that the value of the property is reduced but not completely eliminated, the governmental restraints still effect a taking of our clients' property. There is precedent that regulatory action that results in (1) serious economic harm, (2) interferes with the investment-backed expectations of the property owner, and (3) burdens a few for the benefit of the larger community, constitutes a compensable taking. The proposed remedy is not like a zoning law or regulatory action to enjoin an activity akin to a nuisance. In these circumstances, compensation is not due because compensation has already been made in the reciprocal advantage secured in the similar regulation of others. In this case, the owners of the property are singled out to bear a burden for the public good. Moreover, there is precedent that overly broad regulatory restraints will result in compensable takings because such restraints cannot be said to substantially advance a legitimate exercise of a State's police power to protect public health, safety and the general welfare. The breadth of the proposed remedy is not reasonably necessary for the accomplishment of the State's purpose, i.e., to protect public health.

Future development should have been considered by NJDEP in selecting its preferred remedy. As currently proposed, the

preferred remedy will constitute a taking of the property, entitling the owners to just compensation.

. enjd093/40563/00004/outline/sy.comment
Owner srgmm Job 257 Priority 5
. Queued on b4b43adp Tue Oct 11 13:38:19 1994
Printed Tue Oct 11 13:38:21 1994

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ATTORNEYS FOR Edwin L. Siegel, Edlin Ltd.,
Tooley's Enterprises

AFFIDAVIT OF JANE DOBSON

COUNTY OF ESSEX

STATE OF NEW JERSEY

Jane Dobson, being duly sworn, deposes and says:

1. I am an attorney at law of the State of New Jersey with the firm of Hannoch Weisman, counsel for Edwin L. Siegel, Edlin Ltd. and Tooley's Enterprises. As such, I am fully familiar with the facts set forth below.

2. On August 18, 1994, the New Jersey Department of Environmental Protection issued its Proposed Plan for the PJP Landfill Superfund Site ("Proposed Plan").

3. The Proposed Plan involves, among other items, the fencing of the 87-acre area allegedly encompassing the PJP

Landfill, including barbed wire and warning notices. In addition, approximately 42 acres will be capped with a multi-layer, impermeable solid waste cap with gas venting. The other 45 acres were previously capped as part of an Interim Remedial Measure.

4. On September 1, 1994, I spoke with Sandy Greenberg at the Jersey City Department of Housing and Economic Development. Mr. Greenberg expressed that the City of Jersey City would like to see sites like the PJP Landfill Site eventually developed for some use.

5. On September 12, 1994, I spoke with Betty Kearns, Environmental Engineer at the Jersey City Engineering Department. Ms. Kearns expressed that the City of Jersey City is concerned that implementation of the proposed remedy for the PJP Landfill Site may prohibit future uses of the property. Ms. Kearns further expressed that the City of Jersey City would like to see the property capable of producing tax revenues in the future. Ms. Kearns indicated that the City of Jersey City has received inquiries from several entities in the past expressing an interest in developing this property.

Jane Dobson

JANE DOBSON

Sworn and Subscribed
to before me this 28th
day of September, 1994.

Gina M. Jinks

GINA M. JINKS
A Notary Public of New Jersey
My Commission Expires Aug. 10, 1997

LAW OFFICES OF
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PAMELA S. GOODWIN*
NEW JERSEY MANAGING PARTNER

October 13, 1994

Mr. Donald J. Kakas, Acting Chief
Bureau of Community Relations
Site Remediation Program
Department of Environmental Protection
CN 413
Trenton, New Jersey 08625-0413

RE: PJP Landfill Superfund Site

Dear Mr. Kakas:

Enclosed with this letter are written comments on the Proposed Plan for the PJP Landfill located in Jersey City, New Jersey. These comments are submitted on behalf of the PJP PRP Group ("Group") for inclusion in the site Administrative Record. They represent the consensus of professional opinions of the Group's technical and legal advisors in objectively evaluating the New Jersey Department of Environmental Protection's ("NJDEP") excessively scoped, costly, and unjustified proposed remedy valued at approximately $24 million. In addition to comments on the Proposed Plan, this enclosure outlines the Group's Preferred Remedy which is equally protective, while much more cost effective at an estimated cost of $6.779 million.

Our comments on the Proposed Plan for the PJP Landfill go to three primary concerns. First, the proposed site remedy has been selected in the absence of a number of critical site studies and evaluations which should have been performed, but were not. Had the studies and evaluations identified in the attached comments been performed, NJDEP would have reached different conclusions. Second, the proposed remedy is unjustifiably excessive in scope, encompassing vast areas never associated with the PJP Landfill operations. The remedy scope should only extend to areas of the PJP Landfill, and not to arbitrary geographic boundaries. Third, the results of the risk assessments, conducted as part of the RI/FS at the site, demonstrate that the PJP Landfill simply does not represent a significant environmental or human health risk, either currently or in the future. The

calculated risk levels are well within the ranges acceptable to USEPA, and thus do not suggest such draconian measures.

The Group's Preferred Remedy meets or exceeds the expected performance of NJDEP's proposed remedy for the following reasons:

- It is equally protective of human health with regard to direct contact/ingestion of soils, landfill gas exposure, and remediation of the Sip Avenue ditch.

- It is equally protective of the environment with regard to reduction of contaminant migration via surface water, generation of leachate, landfill gas control, and impact to wetlands and aquatic habitats.

- It complies with ARARs with regard to its geomembrane cap component, and while potentially requiring an ARAR waiver, its asphalt paving component has an equivalent performance.

- It has equivalent performance in short term and long term effectiveness.

- It has equivalent performance in reduction of constituent toxicity, mobility, and volume.

- It has equivalent performance in terms of implementability.

- It exceeds the cost effectiveness of the NJDEP's proposed remedy with an estimated cost of $6.779 million.

The Group believes that NJDEP should re-evaluate its proposed remedy, and suggests that serious consideration be given to the Group's Preferred Remedy before drafting the Record of Decision. The Group would welcome initiation of substantive discussions with NJDEP regarding the Group's Preferred Remedy. Should you have any questions, please feel free to contact me at (609) 393-0057.

Very truly yours,

Pamela S. Goodwin

Pamela S. Goodwin, Esquire
Steering Committee Chairperson
On behalf of the PJP PRP Group

cc: PJP PRP Group
Frank X. Cardiello, Esquire
Patricia Sterns, Esquire

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EXECUTIVE SUMMARY

On behalf of the PJP PRP Group (Group), McLaren/Hart Environmental Engineering Corporation (McLaren/Hart) has reviewed all of the documents NJDEP made available to the Group related to the Proposed Plan issued by NJDEP for the PJP Landfill in Jersey City, New Jersey. Based upon review of that information, this document identifies deficiencies in the Proposed Plan as itemized herein and suggests a preferred alternate remedy (preferred remedy). Deficiencies in the Proposed Plan are outlined as follows:

- The area subject to the remedy as proposed by NJDEP is larger than the area where landfill operations were conducted. There appears to have been no attempt to delineate the landfill boundaries. Without such an evaluation, the need for and/or implementability of a cap over the entire area proposed by NJDEP is not substantiated.

- Actual site background conditions were not evaluated in determining excess human health risk that can be attributed to the site. The studies by the NJDEP rely on published literature values to establish background conditions and improperly presume no past industrial usage in an area of past heavy industrial occupation and usage. Therefore, the comparisons to background in the site studies are inaccurate and result in an exaggerated estimate of risk and overly optimistic estimate of risk reduction.

- Application of NOAA sediment screening criteria is inappropriate because data characterizing a benthic community have not been collected from the Sip Avenue Ditch, and the analysis inappropriately infers effects based on exceedances of the NOAA criteria. Therefore, this comparison should not be utilized to establish a risk warranting remediation of the Sip Avenue Ditch.

- The Proposed Plan contemplates an expanded drum removal program that is inconsistent with the findings of the Remedial Investigation/Feasibility Study (RI/FS). The Remedial Investigation and Drum Removal Reports do not support the Proposed Plan's intention to investigate the entire site for buried drums and subsequent removal activities. In addition, the drum removal program in the Proposed Plan is inconsistent with the National Contingency Plan (NCP) because it was not evaluated in the Feasibility Study (FS).

- There is an unexplained but significant difference between the configuration of the IRM cap constructed by NJDEP in 1985 and the cap construction design in the Proposed Plan. The cap construction of the IRM cap installed by NJDEP was not evaluated in the FS.

- The Proposed Plan indicates that wetlands mitigation will be required as part of the site remedy. The need for wetlands mitigation is not supported by the RI/FS. A functional evaluation of the wetlands should have been conducted prior to a determination that wetlands mitigation is required. Moreover, the Group's preferred remedy for the Sip Avenue Ditch is more beneficial to the environment in that it will not result in the permanent destruction of any wetlands present in the Ditch.

- Based on the information in the Chronic BioMonitoring Report, a determination cannot be made about impacts to surface water and biota attributable to the site. The information provided in the report is not sufficient to support NJDEP's proposed remedial action for the Sip Avenue Ditch and is not adequate to assess the ecological integrity of that portion of the Hackensack River adjacent to the site. The RI/FS should have included an evaluation of baseline ecological conditions at the site, the presence/absence of a viable aquatic community in the

Sip Avenue Ditch, and upgradient chemical conditions of the Hackensack River to determine baseline conditions, the potential for impacts and the need for protection of organisms/habitat associated with the site.

- The human health risks identified by NJDEP as being significant are not greater than the EPA accepted risk range of 10^{-6} to 10^{-4}. NJDEP has not supported the statements that the on-site risks identified (children wading in the Sip Avenue Ditch and inhalation of vented landfill gas by trespassing children, nearby workers and nearby residents) are significant. Based on the NJDEP quantitative human health risk assessment, these risks do not exceed EPA's accepted risk range of 10^{-6} to 10^{-4}. Therefore, conducting a remedial response action addressing the Sip Avenue Ditch and vented landfill gas based on a human health risk is unwarranted.

- The proposed re-routing of the Sip Avenue Ditch is not supported by the RI/FS or the risk assessment and is not cost-effective. The redesign of the Sip Avenue Ditch, as contemplated by the Proposed Plan, requires a 15-foot diameter culvert pipe to be installed beneath the cap to convey drainage. The combined maximum potential flow of all the drainage pipes at the upstream site boundary of Sip Avenue Ditch will not produce a maximum flow which would require installation of a 15-foot diameter pipe beneath the cap. Additionally, maintenance of the culvert would not be possible. Differential settlement of waste material around the culvert would be a concern. Large volumes of waste and soil excavation would be required for installation of the culvert. Cost effective alternatives that are protective of human health and the environment such as lining the Sip Avenue Ditch or excavation of sediments for consolidation on-site should have been evaluated in the FS. Notwithstanding such an evaluation, the potential risks identified for the Sip Avenue Ditch (e.g. children wading in the Ditch) do not

exceed EPA's accepted risk range of 10^{-6} to 10^{-4} and therefore, a remedial response action addressing the Ditch is not warranted based on the human health risk assessment.

- The rationale and cost for installation and operation on a gas management system should be re-evaluated. The human health risk assessment used extrapolated emission concentrations at estimated maximum discharge rates when evaluating potential risks. Even though this approach was utilized, the risk associated with exposure to vented landfill gas is within EPA's accepted risk range of 10^{-6} to 10^{-4}.

- The FS alternatives for landfill gas management are contradictory. Active gas collection was eliminated from consideration in the FS while the gas treatment scenario (flaring) was retained. However, an active system is generally required to facilitate the operation of a flare station.

Based on the evaluation of project files NJDEP made available to the Group and the Proposed Plan, the Group believes that a more appropriate remedy for the site should be selected to provide a better balance of trade-offs in terms of the remedy selection evaluation criteria. The Group's preferred remedy addresses the risks identified for the site, and affords overall effectiveness similar to the Proposed Plan's remedy. The Group's preferred remedy for this site includes the following components:

- A single barrier geomembrane cap that would comply with the current NJDEP guidance document for design and construction of an "impermeable cap" for Lot 1P/Block 1627.2 and Lot 6A/Block 1627.1.

- An asphalt pavement cover for the area east of the IRM cap comprising a portion of Lot 5C and Lots 2A, 3 and 4C of Block 1639.1 similar to the cover utilized by the Hartz Mountain Company during expansion of its' adjacent warehouse facility on landfilled area.

- Components of the single barrier geomembrane cap (in descending order) include:

  - six-inches of vegetative cover;
  - frost protection layer (approximately 12-inches) consisting of general earthfill;
  - a synthetic drainage net;
  - 40 mil geomembrane; and
  - six inch bedding layer.

- Components of the asphalt pavement cover include (in descending order):

  - two inch asphalt concrete pavement; and
  - 3-inch granular subbase.

- A landfill gas management system may be installed if it is determined to be required during the design phase.

- Upgrade of the existing Sip Avenue Ditch to include: excavation of contaminated soil and consolidation within the existing landfill (prior to capping) on Lot 1P; and/or lining the ditch to prevent direct contact with sediments.

- Installation of a chain-link security fence around the entire site as determined during design of the remedy.

- Monitoring of environmental media as needed to evaluate the remedial action effectiveness.

- Institutional controls to regulate future site development.

PJP LANDFILL
COMMENTS TO PROPOSED PLAN

I. INTRODUCTION

On August 18, 1994, the New Jersey Department of Environmental Protection (NJDEP) issued a Proposed Plan for the PJP Landfill Superfund Site in Jersey City, New Jersey. As part of the community role in the remedy selection process, the PJP PRP Group (Group) is providing public comments. The Group has retained McLaren/Hart Environmental Engineering Corporation (McLaren/Hart) to provide technical comments on their behalf. The Group expects that these written comments will be specifically addressed and documented in the Responsiveness Summary section of the Record of Decision (ROD) which will formalize the selection of the remedy.

On the Group's behalf, McLaren/Hart has reviewed all of the documents NJDEP made available to the Group. The Group assumes that these documents constitute the entire Administrative Record. The NJDEP documents reviewed by McLaren/Hart and prepared by or on behalf of NJDEP are as follows:

- Proposed Plan - PJP Landfill Superfund Site dated August 18, 1994 prepared by NJDEP;
- Phase III Feasibility Study For PJP Landfill, Jersey City, New Jersey dated July 22, 1993 prepared by ICF Technology Incorporated for NJDEP;
- Phase II Feasibility Study For PJP Landfill, Jersey City, New Jersey dated May 26, 1993 prepared by ICF Technology Incorporated for NJDEP;
- The ICF Technology, Inc. Phase I Remedial Investigation Report for PJP Landfill, Jersey City, New Jersey dated April 1990, prepared for NJDEP;

- The ICF Technology, Inc. Buried Drum Investigation for PJP Landfill, Jersey City, New Jersey Report dated February 1990 prepared for NJDEP;

- Phase I Feasibility Study For PJP Landfill, Jersey City, New Jersey dated November 15, 1989 prepared by ICF Technology, Inc. for NJDEP;

- Final Report, PJP Landfill Bedrock Monitoring Well Installations dated 11/22/93 prepared by Hardin-Huber Incorporated for NJDEP;

- Chronic Biomonitoring Report, BR93-288, Report #2370 dated 12/7/93 prepared by Aqua Survey Inc. for NJDEP;

- Field Sampling Episode Report, PJP Landfill Sampling Episode Report, Routes 1 & 9, Jersey City, New Jersey, Hudson County, November 4 & 5 and November 15, 17 & 19, 1993 prepared by John Caruso, NJDEP for Marcedius Jameson, NJDEP dated 1/5/94; and

- Appendix 1 - PJP Sites for Mysid Chronic Bioassay Testing (author unknown/undated)
  Appendix 2 - Physical/Chemical Parameters (author unknown/undated)
  Figure - Well Locations (prepared by ICF Technology, Inc./undated)
  Addendum B - Modifications of Chronic Toxicity Test Methods For Use With Ambient Saltwater Toxicity Testing Using Mysiopsis bahia (author unknown/undated).

The format for these comments is to provide a series of major areas of concern with respect to the proposed remedy. Within each area of concern, there is narrative which describes the basis for the comment/concern and a conclusion. The Group's preferred remedy is set forth at the conclusion of these comments.

II. COMMENTS TO PROPOSED PLAN

1) Definition of the Site

The remedy that is proposed by NJDEP includes capping an additional 42 acres beyond the area subject to the IRM. There were no apparent investigations undertaken as to the true extent of the PJP Landfill waste. The FS presumes that the area subject to remediation is defined by geographic boundaries rather than providing the technical basis for including the additional 42 acres.

1.1 The definition of the site has changed over time without any technical rationale or explanation provided.

Originally, the 1970 application to operate a sanitary landfill defined the site size to be 23.05 acres $\pm$ 4% which consisted of Lots Nos. 1P, 1C, 2A, Plot 7 and parts of Lots 3 and 4C of Blocks 1627 and 1639A (See Figure 1). However, in 1971, the PJP Landfill was defined as being Lot Nos. 1A, 2, 5B, 6B, 1P, 1B, 6A of Block Nos. 1627 and 1639A on the NJDEP Certificate of Registration to operate the landfill. These parcels equate to a site size of 61.15 acres. While there was no explanation provided on the Certificate of Registration to indicate why the description was expanded, it should be noted that the Certificate of Registration listed incorrect lot and block numbers. Apparently, an out-of-date reference was used, because Lot Nos. 1A and 1B were combined into Lot No. 1C and Lot No. 5B became Lot No. 5C in May, 1968.

In addition, Lot No. 5B (actually Lot No. 5C) was not listed on the application to operate a sanitary landfill but was added to the Certificate of Registration. The addition of Lot No. 5B (an approximately 37-acre parcel) accounts for the

increase in site size from approximately 24 acres to 61 acres as shown in Figure 2.

The 1983 Remedial Action Master Plan (RAMP) prepared for USEPA defined the size of the landfill to be approximately 71.52 acres encompassing Lots 1C, 2A, 3, 4C, 5C, 1P of Block Nos. 1627 and 1639A using accurate Lot and Block designations, but continuing to include Lot 5C (Lot 5B on the Certificate of Registration). Figure 3 shows the extent of the RAMP site description. The RAMP does not provide an explanation for the increase in size of the site from 61 acres to approximately 71.52 acres.

In 1985, the IRM Final Design Report defined the landfill to be 75.87 acres in size (See Figure 4) and consisted of Block No. 1627 (Lot Nos. 1P, 1C, 2A, 3, 4C, 6A, 7), Block No. 1639A (Lot Nos. 5C, 7E), and Block No. 1640.43 (Lot No. 7D). In the 1987 NJDEP RI/FS RFP, (see Figure 5) the size of the landfill was defined as 88.75 acres but the Block and Lot Nos. have changed to the currently used state system (numeric designation only) Block No. 1627.1 (Lot No. 1H, 5A, 6A, 3B, 4B), Block No. 1627.2 (Lot No. 1P), Block No. 1639.1 (Lot No. 2A, 3, 4C, 5C, 7D), Block No. 1639.2 (Lot No. 5C, 7E, 1C, 7). None of these three site descriptions (1983, 1985, 1987) provide an explanation of the basis of the description or why the site size was expanded in 1983 or 1985.

1.2 PJP Landfill operations were not conducted on all areas currently defined as the site.

The PJP Landfill was operated between 1969, according to NJDEP, and 1974. During this time frame, PJP Landfill operations took place adjacent to the Sip Avenue Ditch, west of the Hartz Mountain Warehouse on Lot 1P of Block

1627.2. However, the Proposed Plan indicates that the entire site (as described by NJDEP) of approximately 87 acres may be capped as part of the selected remedy. Before any determination can be made regarding the extent of areas to potentially be capped, a technical evaluation as to the actual extent of the PJP Landfill should have been made.

There are many areas within the current site description that did not ever receive landfill materials in the course of operating the PJP Landfill. (See Figures 6 through 10) In addition, there are areas within NJDEP's current site description boundary which may have, in fact, been landfilled. However, these areas were landfilled exclusive of operations by the PJP Landfill Company. This conclusion is supported by NJDEP project documents such as the Buried Drum Investigation Report prepared for NJDEP and dated February 2, 1990. As an example, the photographic evidence presented in the Buried Drum Investigation Report, indicates that in TP-12 remains of newspaper dated October 1986 were observed and likewise in TP-14 remains of magazines were observed dated 1976. This information clearly supports the contention that disposal of landfill materials by others occurred after the cessation of operations by the PJP Landfill Company.

1.3 The remedy includes areas that may not need to be capped.

As evidenced by the air photo analysis shown in Figure 6 through 10, many areas such as the automobile junkyard, truck terminal and construction material recycling operations were not used as disposal areas. Additionally, if the presence of fill is used as an indication of an area requiring remediation, it is that unimpacted areas (areas not subject to landfilling) will be erroneously included since random fill has historically been placed for site development in the general

area. Therefore, these areas should not be subject to remedial action involving the PJP Landfill.

Conclusion

The current NJDEP site description of the PJP Landfill is not supported by site investigation work, air photo analysis or historical records. The Proposed Plan's capping remedy should be revised to reflect those areas that were actually used for landfilling by the PJP Landfill Company.

2) **NJDEP Did Not Consider Background Conditions When Evaluating Potential Risks Presented by the Site**

The Human Health Risk Assessment (HHRA) did not utilize site specific data to establish the naturally occurring and anthropogenic background conditions associated with the areas surrounding the site when estimating potential risks from exposure to on-site media. In addition, the risk assessment concludes that excess risks warranting remedial action are present based on soil concentrations which are actually below NJDEP cleanup guidance. These issues become significant when the remedial action objectives are risk-based but the potential risks do not consider background conditions or the effect that background conditions have on the site.

The proposed remedial action for the Sip Avenue Ditch is risk-driven with a majority of the estimated risk attributed to arsenic and carcinogenic PAHs. Due to the fact that site-specific background data were not collected during the RI, generalized background data were obtained from the literature (Shacklette and Boerngen, *Element Concentrations in Soils and Other Surficial Materials of the Conterminous United States*, USGS 1984) for comparison with on-site conditions. Use of literature values, in the absence of on-site

data, does not accurately represent background conditions for this historically industrialized and urban area. This issue is especially important in assessing risks associated with inorganic compounds that also occur naturally and exhibit a high degree of variability associated with inorganic soil concentrations over broad geographical regions. For example, the 20 ppm NJDEP cleanup guidance for arsenic in soil is based upon what NJDEP considers to be "natural background" (NJDEP, *Guidance Document for the Remediation of Contaminated Soils*, June 1994). This is, in fact, higher than the 7-13 ppm background range defined by the Phase I RI and Phase II FS reports and based on Shacklette and Boerngen.

The risk assessment considered inorganic chemicals to be site-related "if the maximum concentration detected at the site was above the range of background concentrations reported in the literature." However, the RI Report also states that, "if only one background value was available in the literature, instead of a concentration range, the chemical was considered to be site-related if its maximum concentration was greater than a factor of two times the background concentration.....the factor of two is regarded as conservative because natural variation in background concentration can be over an order-of-magnitude." If the risk assessment had considered the NJDEP guidance value of 20 ppm for the soil cleanup as a single background value, the point-of-departure for the inclusion of arsenic into the risk assessment would have been 40 ppm versus the 13 ppm value that was used. Since the maximum concentration of arsenic detected in the Sip Avenue Ditch sediment was 20.1 ppm, arsenic would have been eliminated as a potential chemical of concern if NJDEP had followed the same logic utilized in the RI.

According to the RI Report, the Sip Avenue Ditch receives surface water runoff from streets and POTW overflow during high flow periods. Constituents of potential concern associated with such runoff and which originate elsewhere and enter the Ditch includes heavy metals and PAHs (which have been detected in the Ditch). Upgradient sources

and concentrations of these compounds entering the site are demonstrated by the sediment and surface water data associated with Ditch Location #4.

Conclusion

Actual site background conditions should have been examined when assessing potential risks posed by on-site conditions. These conditions may, in fact, be a result of offsite influence. The Sip Avenue Ditch does not originate on-site and does provide a migration pathway for non-site-related contaminants, such as waste-water bypass from the POTW and urban stormwater run-off, to enter on-site media. The upgradient concentrations in surface water and sediments of the Ditch are likely to significantly contribute to on-site habitat degradation in the Ditch.

In addition an analysis of post-cleanup risks indicates that upgradient sources would recontaminate the Ditch. This assessment should have been made in order to differentiate those contaminants, and contaminant concentrations, which are truly site-related versus those which are entering the site from other, non-landfill related sources. The assessment should also have considered NJDEP cleanup guidance in determining chemicals of concern. Without having performed these critical assessments, it is conjecture to conclude there is a site-related impact to sediments in the Sip Avenue Ditch and therefore, the proposed remedial action for the Sip Avenue Ditch may be unwarranted and/or excessive.

3) **Applicability and Comparison to NOAA Sediment Screening Criteria Concentrations is Inappropriate**

3.1 The use of the NOAA sediment screening criteria to evaluate impacts to the Sip Avenue Ditch is not appropriate.

The chemical sensitivity of resident benthic species is highly variable and may differ significantly from the organisms used in laboratory settings. Since no data were collected as to the structure and function of the benthic community in the Sip Avenue Ditch, selection of a remedy based upon a laboratory bioassay result is not appropriate. The ecological community that the remedy is designed to protect may not exist or have the potential to exist at the site. Since upgradient sources of contaminants severely impact the Ditch and Hackensack River, the area is not pristine and the evaluation of impacts to such a system requires information regarding baseline conditions for comparison.

Conclusion

The investigations supporting remedy selection failed to adequately characterize baseline ecological conditions at the site, the presence/absence of a viable aquatic community in the Sip Avenue Ditch, and upgradient chemical conditions of the Hackensack River to determine baseline conditions and the potential for impact and need for protection of organisms/habitat associated with the site. Therefore, a remedy to address impacts to organisms/habitat has not been substantiated.

3.2 The application of NOAA sediment screening criteria to the sediments of the Sip Avenue Ditch is inappropriate because the criteria originates from a pool of data which is not relevant to the Sip Avenue Ditch.

The NOAA values used for comparison to the Sip Avenue Ditch and River sediment data are conservative estimates of "potential" effects and in some cases

are developed from data based on equilibrium partitioning coefficients which have been technically challenged in the scientific literature. [1,2]

The equilibrium partitioning approach to developing sediment criteria does not address bioavailability of the compound or the organic carbon/acid volatile sulfide concentrations in sediment which have been shown to have a significant effect on the binding capacity of sediment and the reduction in bioavailability of a compound. Several chemical and biological processes, including natural chelating agents, can cause chemicals in sediment to be non-toxic and unavailable to aquatic organisms.

The NOAA document referenced, states specifically that the "ER-L and ER-M values are not to be construed as NOAA standards or criteria" (NOAA, 1991).. In addition, these values were used by NOAA to "rank sites with regard to the potential for biological effects, assuming that the sites in which the average chemical concentrations exceeded the most ER-L and ER-M values would have the highest potential for effects" (NOAA, 1991). Exceedances of these values do not infer effects at a particular site.[3]

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1 (Geisy, J. and R.A. Hoke. 1990. Freshwater sediment quality criteria: Toxicity bioassessment. In: Baudo, R., J. Giesy, and H. Muntau. (eds), Sediments: The Chemistry and Toxicology of In Place Pollutants, Lewis Publishers, Chelsea, MI, pp. 265-348 and

2 USEPA, 1990. Evaluation of the Equilibrium Partitioning (EqP) Approach for Assessing Sediment Quality. Report of the Sediment Criteria Subcommittee of the Ecological Processes and Effects Committee. EPA-SAB-EPEC-90-006. United States Environmental Protection Agency. Washington, D.C.

3 National Oceanic and Atmospheric Administration (NOAA). 1991. The Potential for Biological Effects of Sediment-Sorbed Contaminants Tested in the National Status and Trends Program. NOAA Technical Memorandum NOS OMA 52.

The sensitivity of the resident species, the bioavailability of the chemicals of interest, the potential synergistic or antagonistic effects on toxicity for the mix of chemicals present, and the designated uses of the Sip Avenue Ditch should have been evaluated. Remedial decisions based on a limited data set and comparisons to values such as NOAA ER-L and ER-M proposed for use as screening tools only is a misapplication, overstates the risk and therefore, leads to erroneous conclusions regarding the need for remedial action.

Of the data presented, the average (mean) sediment concentrations only exceeded the NOAA ER-M values for 4 inorganics. These exceedances were well within an order of magnitude difference for all four compounds (antimony, copper, nickel and zinc).

By definition, ER-L values are concentrations in sediment at the low end (10th percentile) of the range in which effects were observed or predicted and are used by NOAA as concentrations above which adverse effects may begin or are predicted among sensitive life stages and/or species as determined in sub-lethal tests. ER-M values are concentrations in sediment at the 50th percentile point in the screened data and were considered the level above which effects were frequently or always observed among most species. "Effects" do not necessarily equate with mortality. Promulgated criteria protective of aquatic life such as ambient water quality criteria (AWQC) do equate with a mortality factor and are developed based upon the use of LD_{50} (a statistically or graphically estimated dose that is expected to be lethal to 50% of a group of organisms under specified conditions) results associated with standard acute and chronic bioassay testing. Therefore it was inappropriate to use the NOAA "effects" based values for comparison to site data and the determination of ecological impact at the site.

Conclusion

The approach of utilizing NOAA sediment screening criteria to assess the impacts associated with sediments overstates the risk and leads to conclusions regarding the need for remedial action which may not be necessary. Instead, biological-effects based approach for deriving threshold concentration limits for chemicals in sediment should have been used. Site-specific, biological-effects based approaches such as toxicity testing and the Tissue-Residue Based (TRB) method, which relies on acceptable tissue concentrations and biota sediment accumulation factors (BSAFs) to calculate sediment concentrations should have been considered. Methods that incorporate direct measures of biological effects, such as those derived from toxicity testing and chemical investigations, apparent-effects thresholds (AET), spiked sediment bioassays (SSB), sediment quality triads (SQT), and toxicity identification evaluations (TIE) can account for additive, synergistic and antagonistic effects to benthic organisms in the derivation of threshold concentration limits for chemicals in sediment.

4) Inconsistency Between Drum Removal Scope in Feasibility Study vs. Proposed Plan

4.1 The scope of work related to the Drum Removal Option has inexplicably changed from addressing the two known areas to all suspected areas and removal of visually contaminated soils. The expanded drum removal work scope described in the Proposed Plan constitutes a remedial action that is inconsistent with the NCP because it was not evaluated in the FS. There has been no technical rationale or information presented in the RI/FS to support the expanded scope of work involving drum removal.

The Proposed Plan's scope of work for this option is inconsistent with the Phase III FS for the site. The Proposed Plan described the Drum Removal Option as the removal of all known and suspected buried drums and associated visually contaminated soils prior to capping. Excavation would begin at test pit locations TP-6 through TP-17 and TP-19 and continue until groundwater is encountered, fill area depth limit is encountered, or until no more drums are found.

In contrast, Section 2.9 - Excavation and Removal of Known Contaminants Option in the Phase III FS report evaluates the excavation of 5 known drums at only two test pits (TP-10 and TP-17). This option also considered excavating associated contaminated soils surrounding the drums at the same time after sampling to verify contamination.

The ICF Technology, Inc. Phase I RI report (April 1990) and the ICF Technology, Inc. Buried Drum Investigation Report (Feb. 1990) did not indicate the presence of drums in TP-6 through TP-8 and TP-9. Eleven drums from four test pits (TP-10, TP-11, TP-17, TP-19) were removed and overpacked during the Phase I RI. Of these, six drums were sampled and disposed offsite and the five remaining drums were over-packed and returned to TP-10 and TP-17. At TP-12 through TP-16 NJDEP personnel did not observe any drums to be intact or to contain liquids and therefore, chose not to continue excavation and removal activities within these test pits.

The Proposed Plan further states that associated visually contaminated soils will be excavated and removed, however it did not identify what criteria will be utilized to determine if soils are visually contaminated or what would constitute contamination.

Conclusion

The drum removal component of the proposed remedy is inconsistent with the NCP because it was not evaluated in the FS. NJDEP's preference for expanding the drum removal program is inconsistent with the findings of the project documents which indicate that subsurface investigations related to locating drums have been extensive.

In February 1991 USEPA issued the guidance document Conducting Remedial Investigations/Feasibility Studies for CERCLA Municipal Landfill Sites. This document provides the framework for the remedy selection process for municipal landfills and indicates that it has been the historical experience (i.e. sound scientific judgement, cost-benefit analysis and actual remedies selected) and the expectation of the NCP that the containment of waste is a likely response action for municipal landfills. This document also indicates that the excavation of landfill contents should only be considered if a "hot spot" of significantly different character from the majority of landfill contents is identified.

No other definable "hot spots" of significantly different character except for the drums identified in TP-10 and TP-17 are present within the landfill as indicated by the project documents such as the Remedial Investigation Phase I, Supplemental RI work and the Buried Drum Investigation Report. These documents present the investigation, characterization, and removal activities which took place at the site. The results of this work indicate that a significant volume of drums and waste material has already been removed from the site and that the five drums mentioned are the only intact drums still present.

The Proposed Plan indicates that the landfill material is not presenting an adverse impact to receptors of groundwater. Therefore, the search for and removal of any suspected drums or soil beyond those already identified will not facilitate the achievement of the remedial objectives and should not be undertaken as part of the remedial response.

5) Inconsistency between IRM cap and NJDEP recommended cap

5.1 There is an unexplained but significant difference between the configuration of the IRM cap installed by NJDEP in 1985 and the cap design in the NJDEP Proposed Plan.

A statement was presented (Section 3.3.1.2, Page 26 of the Phase I FS) relative to the long term adequacy of a single barrier cap versus composite caps. The specific sentence reads: "single barrier caps are susceptible to cracking and leaking due to freeze/thaw and settlement". The single barrier cap was eliminated in the Phase I FS by NJDEP because of this concern.

A single barrier cap composed of "three layers" was previously placed above the 45-acre section of the landfill during the IRM by NJDEP. The layers consisted of (in descending order): six-inches of topsoil; 12-inches of clay; and, a six-inch cover layer. While it was judged to be adequate for the area subject to the IRM, this specific soil cap option was not considered as part of the FS. Instead, the soil cap that was considered in the FS simply consisted of a 24-inch layer of topsoil (Alternative LF-3). The main deficiency of LF-3 identified in the FS was the lack of a low permeability component, but it appears that the remedy selection process was biased toward a more expensive multi-layer synthetic cap which would not afford any greater protection to human health than the IRM cap.

5.2 The cap construction utilized for the IRM in 1985 was not evaluated in the FS.

The text on page 2-19 of the Phase III FS asserts that: "A solid waste cap is more permeable to water infiltration." However, the document does not provide engineering data to support this definitive statement. While no evaluation of the IRM cap function and efficiency was performed, the FS concludes that a single barrier cap similar to the IRM cap is inadequate for the remaining area. Standard engineering practice recognizes that a properly designed and installed single barrier cap can be just as effective as a multilayer cap in preventing water infiltration.

Conclusion

Since it was the determination of the NJDEP that the IRM cap functions as intended and is adequate (see 8/18/94 Transcript of Public Meeting), an extension of the existing cap construction would be sufficient to mitigate the potential risks identified in the Proposed Plan. This should have been evaluated in the FS.

6) Ecological Identification and Characterization

6.1 It is a presumption in the Proposed Plan that wetlands mitigation/land banking will be required as part of the remediation of the site.

There is no information on the functional value of these wetlands or their value to the surrounding ecosystem. The need for and extent of potential mitigation measures that might result from construction of the proposed cap cannot be

evaluated if the NJDEP failed to assess the functional value of impacted wetlands. Therefore, it is premature to conclude that mitigation measures are necessary.

The Proposed Plan also states that the anticipated remedial action would result in the loss of some wetlands associated wildlife species. However, since the NJDEP did not evaluate the existing wetlands or perform a species inventory, there is no information available as to whether wildlife is supported. Before compensating measures could have been found to be justified and necessary, a comprehensive evaluation of functional valve and alternatives should have been performed.

Conclusion

A functional evaluation of the wetlands should have been conducted prior to the determination that wetlands mitigation is required. This type of assessment could have scientifically determined the type of compensatory measures, if any, that may be required.

6.2 There are insufficient data to characterize Sip Avenue Ditch as an aquatic habitat, or that site-derived constituents contribute to potential ecological risk.

The most common causes of aquatic life toxicity in sediments (e.g., ammonia, hydrogen sulfide, and low dissolved oxygen) are not evaluated in the data presented. There are no conclusive data presented in the studies which demonstrate: 1) a viable benthic community exists in either the Sip Avenue Ditch or the Hackensack River, and 2) that the chemical constituents detected in

sediment and surface water of both systems are driving potential toxicity to aquatic organisms.

Conclusion

The failure of past studies to characterize the presence/absence of a viable aquatic community and use a biological-effects based approach for deriving threshold concentration limits for chemicals in sediment makes the selection of the proposed remedy involving the Sip Avenue Ditch unfounded. These past studies should have incorporated the evaluation of ammonia, hydrogen sulfide and dissolved oxygen into the analysis, which would enable evaluation of the aquatic toxicity.

7) **Appropriateness of Chronic BioMonitoring Report**

7.1 Based on the information in the Chronic BioMonitoring Report, a determination cannot be made about impacts to surface water and biota attributable to the site, contrary to what is stated in NJDEP's Proposed Plan.

7.1.1 In order to adequately assess the nature and extent of ecological impacts to any aquatic system, particularly one as complex as the Hackensack River, it is standard and customary to evaluate site-specific data pertaining to ambient benthic and water column organisms and general quality of habitat. Further, since the system is not pristine and has been degraded by physical and chemical stresses from numerous sources (including upgradient sources entering the Ditch from Routes 1 and 9), it is critical to establish baseline conditions for the above endpoints so that non-site related impacts are not inappropriately ascribed to site

discharges. This also applies to the Sip Avenue Ditch which is receiving degraded water prior to entering the site and is tidally influenced by the Hackensack River. The current data set, which consists of chemical concentrations measured in two locations in the Ditch and the River, and was used to select the NJDEP proposed remedy, is either adequate to assess the ecological integrity of the current system nor are the data adequate to differentiate site-related contributors to degradation, if any exist.

Physical/chemical data (grain size, hydrogen sulfide in sediment, total organic carbon, dissolved organic carbon, ammonia and temperature) should have been collected and used to conduct an appropriate evaluation of the sediment and surface water data and bioassay results. In light of the conflict between the analytical data and bioassay results, these parameters could have provided valuable information in determining toxicity in these systems.

Conclusion

The site studies should have included an evaluation of baseline ecological conditions at the site, the presence/absence of a viable aquatic community in the Sip Avenue Ditch, and upgradient chemical conditions of the Hackensack River to determine baseline conditions and the potential for impact and need for protection of organisms/habitat associated with the site. Therefore, a remedy to address impacts to organisms/habitat has not been substantiated.

7.1.2 Inconsistencies in the analytical and bioassay results require that more information regarding test conditions be made available and presented with the data.

Freshwater mysids are distinctly stenothermal, cold water organisms typically restricted to the hypolimnetic (bottom) layer in stratified lakes in water temperatures of 15 degrees celsius. Their mode of feeding is by filtration of small zooplankton, phytoplankton and particulate detritus. Many marine species exist and are found in warmer waters in algae and tidal grass. Based upon the data and bioassay methodology presented, it cannot be concluded that the cause of mortality was the test solution. Limited information regarding test conditions was provided and feeding, temperature, salinity or flow regimes were not reported. The mortality may well have been caused by the test conditions and the person(s) performing the test rather than the test solution.

The Field Sampling Episode Report of November 4, 5, 15, 17, and 19, 1993 indicates "all parameters ok" for UG1-2 and DG1-2 water. McLaren/Hart assumes that the same or similar waters were used in the Aqua Survey, Inc., Chronic Biomonitoring Report. It is, therefore, unclear as to what would be driving the toxicity in those waters. Since the sample analytical results for a limited suite of chemical parameters were, in fact, non-detect, it can only be concluded that an unknown parameter is driving the toxicity (e.g., temperature, ammonia, dissolved oxygen, etc.).

This question is significant when considering the results of the analysis of water from location "SIPA" (which indicated some presence of chemical contamination at the point where the Ditch enters the property), was responsible for only 30% mortality in the bioassay; while the "SIPC" water in which all chemical

parameters were "ok" (i.e., non-detect) saw an 87.5% mortality in the mysid bioassay.

Conclusion

A biological-effects based approach that incorporates direct measures of biological effects, such as those derived from toxicity testing and chemical investigations, apparent-effects thresholds (AET), and toxicity identification evaluations (TIE) should have been used. Additional parameters for analysis that have the potential to influence or drive toxicity in surface water such as dissolved oxygen, ammonia, BOD, and COD, should have been evaluated and considered.

7.2 Relevant background reference areas should have been identified in order to allow a comparison of the bioassay results associated with the site.

Up-river bioassay data were not significantly different from those associated with the site (i.e., downstream) which would demonstrate overall degradation of the water quality of the River, rather than degradation specifically associated with the site. Similarly, upgradient bioassay results in the Sip Avenue Ditch indicate that the ambient water quality of waters entering the property is degraded. These potential upgradient, off-site sources contributing hazardous substances to the Ditch would serve to re-contaminate the Ditch subsequent to the remediation described in the Proposed Plan. Remediation of the Ditch, based on substances entering the Ditch from the site is not warranted.

Conclusion

Baseline ecological conditions at the site, the presence/absence of a viable aquatic community in the Sip Avenue Ditch, and upgradient chemical conditions of the Sip Avenue Ditch and the Hackensack River should have been characterized to determine baseline conditions for comparison. The potential for impact and need for protection of organisms/habitat associated with the site should have been determined as a result of the biomonitoring effort.

8) Human Health Risk Assessment - Exposure Scenarios and Criteria

8.1 The significant on-site risk identified as unacceptable in the Proposed Plan is not greater than the EPA accepted risk range of 10^{-6} to 10^{-4}.

8.1.1 The on-site risk associated with children wading in the Sip Avenue Ditch, identified as unacceptable in the Proposed Plan, is not greater than the EPA's acceptable risk range of 10^{-6} to 10^{-4}.

The Proposed Plan states that the primary risks identified in the HHRA are those associated with children who are subject to incidental ingestion and dermal absorption of chemicals in the Sip Avenue Ditch sediment while wading in the ditch water. The carcinogenic risk estimated for children wading in the Sip Avenue Ditch is presented as 1×10^{-6} for the average case individual and 4×10^{-5} for the plausible maximum case. Neither of these values exceed EPA's acceptable risk range of 10^{-6} to 10^{-4}.

Conclusion

NJDEP has not supported the statement that this risk is unacceptable using site-specific data to provide a quantitative argument expressing risks in excess of 10^{-6} to 10^{-4}. The calculated potential risk to human health does not support the remedial alternative decision. Based on the HHRA, there is no need to conduct a remedial response action addressing the Sip Avenue Ditch because the identified site risks are within EPA's acceptable risk range of 10^{-6} to 10^{-4}.

8.1.2 Risk estimates for the inhalation of vented landfill gas (by trespassing children, nearby workers and nearby residents) do not exceed EPA's acceptable risk range.

The Proposed Plan identifies an inhalation risk from landfill gas, although the risk assessment calculations for all three exposure scenarios do not indicate a risk exceedance greater than 2×10^{-6}.

The Proposed Plan concludes that inhalation of vented landfill gas (by trespassing children, nearby workers and nearby residents) is the second of two scenarios resulting in unacceptable risk estimates. However, a review of the HHRA indicates that the plausible maximum case individual in the child/trespass scenario, with a risk estimate of 2×10^{-6}, was the only risk estimate greater than 10^{-6}, but within the 10^{-6} to 10^{-4} acceptable risk range for inhalation of landfill gasses. All other risk estimates for this exposure pathway (i.e. the average child/trespass individual, and the average and maximum case individuals for nearby workers and residents) were less than 1×10^{-6} (i.e. ranging from 3×10^{-10} to 3×10^{-7}) and therefore, do not pose a risk that would be considered unacceptable.

Conclusion

NJDEP has not supported the conclusion that the potential risk from inhalation of landfill gas is unacceptable using a quantitative argument to illustrate potential risks in excess of the 10^{-6} to 10^{-4} range. Based on the HHRA, there is no need to conduct a remedial response action addressing vented landfill gas because the identified site risks are all within or less than EPA's acceptable risk range of 10^{-6} to 10^{-4}.

8.2 Risk estimates associated with the presence of carcinogenic PAHs (CaPAHs), particularly in the child trespass scenario, are misrepresented based upon the summation of analytical results for this class of chemicals versus the evaluation of individual components.

The Proposed Plan identifies CaPAHs in the Ditch sediment as one of the primary "drivers" in the child/trespass scenario. These chemicals were addressed as a class of compounds when calculating risk versus estimating risk for each individual CaPAH detected. Therefore, the concentration of CaPAHs in on-site media is presented as the sum of all CaPAHs detected. This overly conservative approach misrepresents the potential carcinogenic risk presented by the individual CaPAHs, and their accompanying varying risk factors, found in the environmental media on-site.

Conclusion

The raw data presented in the RI appendices illustrates that analysis of individual PAHs was conducted on samples collected during the RI. Since this class of compounds is noted in the HHRA to be driving the health risk

estimate for children wading in the Sip Avenue Ditch, the risk associated with the individual components should have been evaluated. Evaluation of these individual components would be consistent with current USEPA Risk Assessment Guidance for Superfund (RAGS) which suggests that chemicals having individual toxicity factors (i.e. cancer potency factors and reference doses) should be evaluated separately and not as a class of compounds. This is particularly important when considering the individual cleanup criteria that have been developed for several of the CaPAHs (as well as non-CaPAHs). Cleanup criteria for some of the CaPAHs ranges from 0.66 ppm to 40 ppm. This wide range of concentrations demonstrates that the HHRA should have examined the potential risks associated with individual CaPAHs detected on-site in order to provide an accurate estimation of potential risk associated with these compounds.

8.3 The potential off-site risk (upstream of the site) is actually greater than risk estimates for the potential exposure to current on-site conditions.

Based upon the HHRA in the Phase I RI report, potential offsite risk (associated with exposure to the Hackensack River, upstream of the site) is greater than risk estimates for children exposed to chemicals in the Sip Avenue Ditch via incidental ingestion and dermal absorption of chemicals in sediment and surface water.

Risks estimated for a child swimming in the Hackensack River, upstream of the site, was determined to be greater than that associated with wading in the Ditch on-site. This indicates that areas surrounding the site present an example of "background hazard" associated with areas that are historically industrial. This is illustrated by examining the maximum arsenic concentration detected in the sediment of the Hackensack River, upgradient of the Sip Avenue Ditch, which

was greater than 60 ppm versus the maximum concentration in on-site ditch sediment which was 20.1 ppm.

Conclusion

The issue of potential risk associated with anthropogenic background concentrations of the chemicals detected on-site should have been considered based upon the historical industrial land use on and around the site. The concentrations of the chemicals detected on-site should be directly compared with data for areas surrounding the site, if possible, to illustrate the potential for risk associated with the "background" conditions resulting from prolonged industrial land use.

8.4 In calculating the potential risk, the HHRA used the detection limit as the concentration present when a non-detect was indicated for inorganic chemicals in determining site-wide averages of the compounds. This practice misrepresents site-wide inorganic concentrations as being greater than the raw data indicates, thereby artificially inflating the risk (i.e. making it appear more significant than it is).

The HHRA presented in the Phase I RI Report incorporated each non-detect result for organic chemicals into the site-wide mean by using one half the sample-specific detection limit. However, for inorganic chemicals, when a sample result was non-detect the detection limit was used rather than one-half the detection limit. This practice views a non-detection of an inorganic chemical as if it were a detection, ultimately misrepresenting inorganic concentrations on-site as being greater than the raw data indicates.

Conclusion

Prior to selecting the remedy, risks associated with inorganic chemicals should have been reevaluated using one-half the detection limit for non-detect data when calculating the mean concentration according to RAGS[4]. This is particularly important in addressing an inorganic compound such as arsenic, which is noted as a primary chemical of concern in estimating on-site risk.

9) Re-routing of Sip Avenue Ditch

9.1 The scope of the remedy as it pertains to the Ditch is inconsistent with the potential risk determined by NJDEP and unsupported by site engineering data.

Arsenic was identified as one of the chemicals which contributed significantly to potential risks posed by exposure to sediment in the Sip Avenue Ditch. However, the maximum concentration of arsenic detected in the sediment on-site is 20.1 ppm which is statistically insignificant in comparison with NJDEP's cleanup guidance of 20 ppm for arsenic in soil. Also refer to comment 8.1.1.

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[4] USEPA. December 1989. Risk Assessment Guidance for Superfund, Volume I: Human Health Evaluation Manual, Part A. U.S. Environmental Protection Agency, Office of Emergency and Remedial Response, Washington, D.C.

Conclusion

Based upon the current cleanup guidance for arsenic in soil (20 ppm), the inclusion of arsenic as one of the chemicals of concern in Ditch sediments should be reevaluated.

9.2 The remedy proposed for the Sip Avenue Ditch is not supported by the RI data, is not cost-effective and is excessive based on the risks associated with the Ditch.

The redesign of the Sip Avenue Ditch presented in the FS requires a 15-foot diameter culvert pipe to be installed beneath the cap to convey drainage. Currently at the upstream site boundary flow entering the Ditch is from stormwater drainage pipes which each have an individual diameter of two to three feet. The FS has not presented the evaluation of the potential maximum flow that could enter the site. The maximum potential flow out of all of the drainage pipes at the upstream site boundary of Sip Avenue Ditch could not physically combine to produce a maximum flow which would require a 15-foot diameter pipe to be installed beneath the cap as contemplated in the FS. The maximum possible flow through the proposed 15-foot diameter pipe could only come from upstream sources since no surface runoff could be collected by an enclosed pipe beneath the cap.

Conclusion

Alternatives that are protective of human health and the environment, and are cost-effective such as lining the Ditch, or excavation of sediments for consolidation on-site should have been evaluated. A hydrologic evaluation of the maximum potential flow should also have been performed.

10) Landfill Gas Management Issues

10.1 The HHRA used extrapolated emission concentrations at estimated maximum discharge rates when evaluating risks which are overly conservative.

Landfill gas vent sampling was described in the Phase II FS. The gas was collected and analyzed utilizing EPA Method TO-14. However, the USEPA and the NJDEP recommend that EPA Method 25C be utilized for sampling and analysis of landfill gas. Results of the non-methane gases analyzed were reported in units of ppbv. Although the RI Report stated that the average and maximum values were evaluated, the "average" data was actually an average of the maximum concentrations detected.

Conclusion

The non-methane organic compounds should have been quantified on a weight/time basis with the results reported in pounds per eight hours. Using this information, it would be possible to accurately determine potential exposure impacts from landfill emissions.

10.2 The Feasibility Study alternatives for landfill gas management are contradictory.

Active gas collection was eliminated from consideration while the gas treatment scenario (flaring) was retained for both the Phase I and Phase II FS. However, an active system is generally required to facilitate the operation of a flare station. Consequently, it is not logical to retain one technology and eliminate the other.

Conclusion

The need for and type of gas management system should be determined during the design phase.

The following sentence on page 4-7 (Cost) of the Phase II FS states: "The annual operation and maintenance cost for the cap vent system (including replacement of the canisters), periodic monitoring, and review are also estimated to be low". However, replacement costs of activated carbon canisters (for the treatment of landfill gas) can be significant, especially if the gas flow rates are high and/or organic compound concentrations are high.

Conclusion

The rationale and cost for installing and operating a gas management system as well as the type of system should be re-examined.

11) PJP PRP Group Preferred Alternative Remedy

Based upon the evaluation of the documents reviewed, including the Proposed Plan, the Group believes that there is a remedy for the site that provides a better balance of trade-offs in terms of the evaluation criteria. The Group's preferred remedy addresses the risks identified for the site, and affords overall effectiveness equal to the remedy in the Proposed Plan. The Group's preferred remedy consists of two separate options for the two distinct landfill areas at the site. A brief description of each area and the Group's preferred remedy is described below.

The first area includes Lots 6A and 1P (Figure 11) of Block Numbers 1627.1 and 1627.2 where recreational vehicles have been scrapped and which received landfill materials during operation

of the PJP Landfill Company. This area will be remediated using a single barrier geomembrane cap. The combined area for these parcels is 13.15 acres.

The second area (Figure 11) includes the Automobile Junkyard and the area formerly used during the IRM as a drum storage pad area. These areas encompass portions of Lot 5C, 2A, 3 and 4C of Block 1639.1. The remedy for this area incorporates an asphalt pavement cover. The total combined area of these lots is approximately 20.66 acres.

The preferred remedy proposed for this area is based upon and similar to, the action that Hartz Mountain undertook when expanding its warehouse adjacent to Lot 1P. During expansion of the Warehouse facility, Hartz Mountain covered landfilled areas on their property with an expanded building and pavement. The Group believes that this asphalt cover alternative is supported by the different use of the area, minimal if any, landfilling of the area in the past, the similarities to the Hartz Mountain Warehouse cover and that it is protective of the potential risks identified by NJDEP. Constructing a final asphalt pavement surface will also provide an opportunity for beneficial usage by the community, which is a desirable end-use for community leaders and business.

Components of the Group's preferred remedy include:

- Removal of large objects (e.g. buses, automobiles, etc.) or obstructions that will hinder cap construction. Materials to be removed will be determined during the remedial design.

- Clearing and grubbing of existing vegetation as needed and regrading of the landfill (as needed) to provide an acceptable surface for cap construction. Final grades will be designed to provide surface water management and to minimize erosion. Final grading requirements will be presented during the remedial design.

- Installation of the cap system and cover system described below:

Area 6A and 1P (RV Area) Cap System

A detail of the proposed cap system for this area is presented in Figure 12 (Modified Geomembrane Cap). The proposed construction materials for this cap system (in descending order) includes:

* six-inches of vegetative cover soil;
* 12-inches of general earthfill;
* an optional synthetic drainage net (with geotextile bonded to both sides);
* 40-mil geomembrane; and
* six-inch bedding layer.

Lots 2A, 3, 4C, 5C (Automobile Junkyard and former Drum Storage Pad area) Asphalt Cover

The proposed construction materials for this cover system (in descending order) include:

* two-inches asphalt concrete pavement; and
* three-inch granular subbase.

The final cap and cover configurations and construction materials will be determined during the remedial design. Following installation of the cap/cover systems, the areas will be maintained as needed.

- The gas generating potential of these areas will be evaluated during the design phase to determine if a landfill gas management system is required.

- Upgrade of the Sip Avenue Ditch to include: excavation of contaminated soil and consolidation within Lot 6A or 1P (prior to capping); and/or lining the ditch in order to prevent contact with the sediments.

- Provision of erosion and sediment control appurtenances as needed to control erosion and to be in compliance with applicable regulations. The erosion and sediment control features typically consist of stormwater drainage channels, drop inlets/catch basins, stilling basins and sedimentation basins.

- Monitoring of the environmental media as needed to evaluate the remedial action effectiveness.

- Institutional controls to regulate future site development.

A comparative analysis between the NJDEP remedy in the Proposed Plan and the Group's preferred remedy is presented in Table 1. This comparative analysis reveals that the Group's preferred remedy meets or exceeds the evaluation criteria. A summary of the estimated cost of the Group's preferred remedy is provided in Table 2.

The comparative analysis summarized in Table 1 indicates that for EPA's threshold criteria (overall protection and compliance with ARARs); both NJDEP's proposed remedy and the PJP PRP Group preferred remedy compare favorably. The Group's preferred remedy mitigates the human health and environmental risks identified for the site. In terms of the other EPA evaluation criteria (shot-term and long-term effectiveness, reduction of toxicity, mobility and volume, and implementability); the Group's preferred remedy also compares favorably to the

NJDEP proposed remedy. However, the Group's preferred remedy is more cost-effective that the NJDEP proposed remedy while affording equal protectiveness. Therefore, the Group's remedy strikes a better balance between the EPA evaluation criteria and is preferable remedy.

TABLE 1

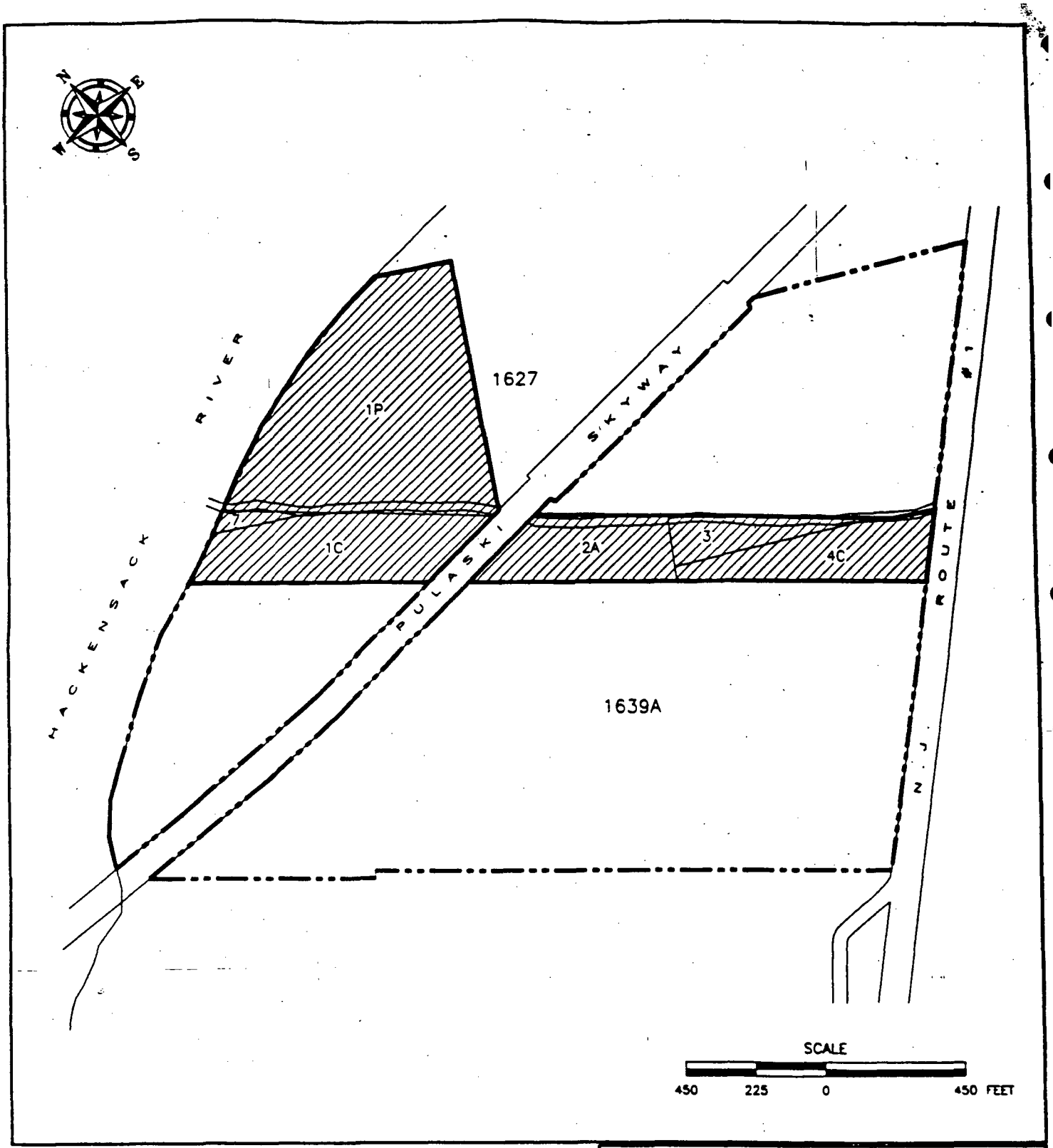
COMPARATIVE ANALYSIS OF ALTERNATIVES
NJDEP PROPOSED REMEDY VS PJP PRP GROUP PREFERRED REMEDY
PJP LANDFILL
JERSEY CITY, NEW JERSEY

Evaluation Criteria	NJDEP PROPOSED REMEDY Alternative LF-4 NJDEP Solid Waste Cap	PJP PRP GROUP PREFERRED REMEDY Modified Geomembrane Cap/Asphalt Pavement Cover
1. OVERALL PROTECTIVENESS		
HUMAN HEALTH PROTECTION		
Direct Contact/Soil Ingestion	Cap reduces direct contact risk and soil ingestion.	Cap and cover will reduce direct contact risk and soil ingestion
	Cap reduces air inhalation potential.	Cap and cover will reduce air inhalation potential.
Gas Migration	Landfill gas control system will reduce potential for gas migration	Landfill gas control system will (if required) reduce potential for gas migration
Sip Avenue Ditch	Ditch to be lined.	Contaminated soil excavated/ consolidated. Ditch to be lined.
ENVIRONMENTAL PROTECTION		
Migration of contaminants via surface water	Cap reduces migration potential.	Cap and cover reduces migration potential.
Generation of Leachate	Cap reduces surface water infiltration	Cap and cover reduces surface water infiltration
Gas build-up	Landfill gas control system will reduce risk.	Landfill gas control system (if required) will reduce risk.
Wetlands/Terrestrial and Aquatic wildlife	Some loss of associated species. Wetlands mitigation determined to be required.	Some loss of associated species. Wetlands mitigation uncertain.
2. COMPLIANCE WITH ARARS		
	Remedy expected to meet or exceed ARARs.	Geomembrane cap expected to meet or exceed ARARs.
		Asphalt pavement cover may require ARAR waiver based on equivalent level of performance.

TABLE 1 (Continued)

COMPARATIVE ANALYSIS OF ALTERNATIVES
NJDEP PROPOSED REMEDY VS PJP PRP GROUP PREFERRED REMEDY
PJP LANDFILL
JERSEY CITY, NEW JERSEY

Evaluation Criteria	NJDEP PROPOSED REMEDY Alternative LF-4 NJDEP Solid Waste Cap	PJP PRP GROUP PREFERRED REMEDY Modified Geomembrane Cap/Asphalt Pavement Cover
3. SHORT-TERM EFFECTIVENESS	Temporary risk during clearing and grubbing, grading and cap construction.	Temporary risk during clearing and grubbing, grading and cap construction.
4. LONG-TERM EFFECTIVENESS AND PERMANENCE	Risks significantly reduced as long as cap is maintained.	Risks significantly reduced as long as cap and cover are maintained.
5. REDUCTION OF TOXICITY, MOBILITY AND VOLUME	No reduction of toxicity or volume. Cap restricts precipitation infiltration and therefore could reduce mobility of contaminants.	No reduction of toxicity or volume. Cap and cover restricts precipitation infiltration and therefore could reduce mobility of contaminants.
6. IMPLEMENTABILITY	Alternative is technically feasible. Construction materials readily available. Specialty contractor/material required for geomembrane installation. Administrative feasibility most likely not a problem. On-site buildings/structures and proximity to Hackensack River and Pulaski Skyway may be problematic.	Alternative is technically feasible. Construction materials readily available. Specialty contractor/material required for geomembrane installation. Administrative feasibility most likely not a problem. On-site buildings/structures and proximity to Hackensack River and Pulaski Skyway may be problematic.
7. COST EFFECTIVENESS		
Capital Cost	$22M	$5.826M
Annual O&M	$0.369M	$0.220M
Present Worth	$23.7M	$6.779M



SITE DEFINITION = 23.85 ACRES

LEGEND

"SITE" BOUNDARY-1994 PROPOSED PLAN

PJP LANDFILL

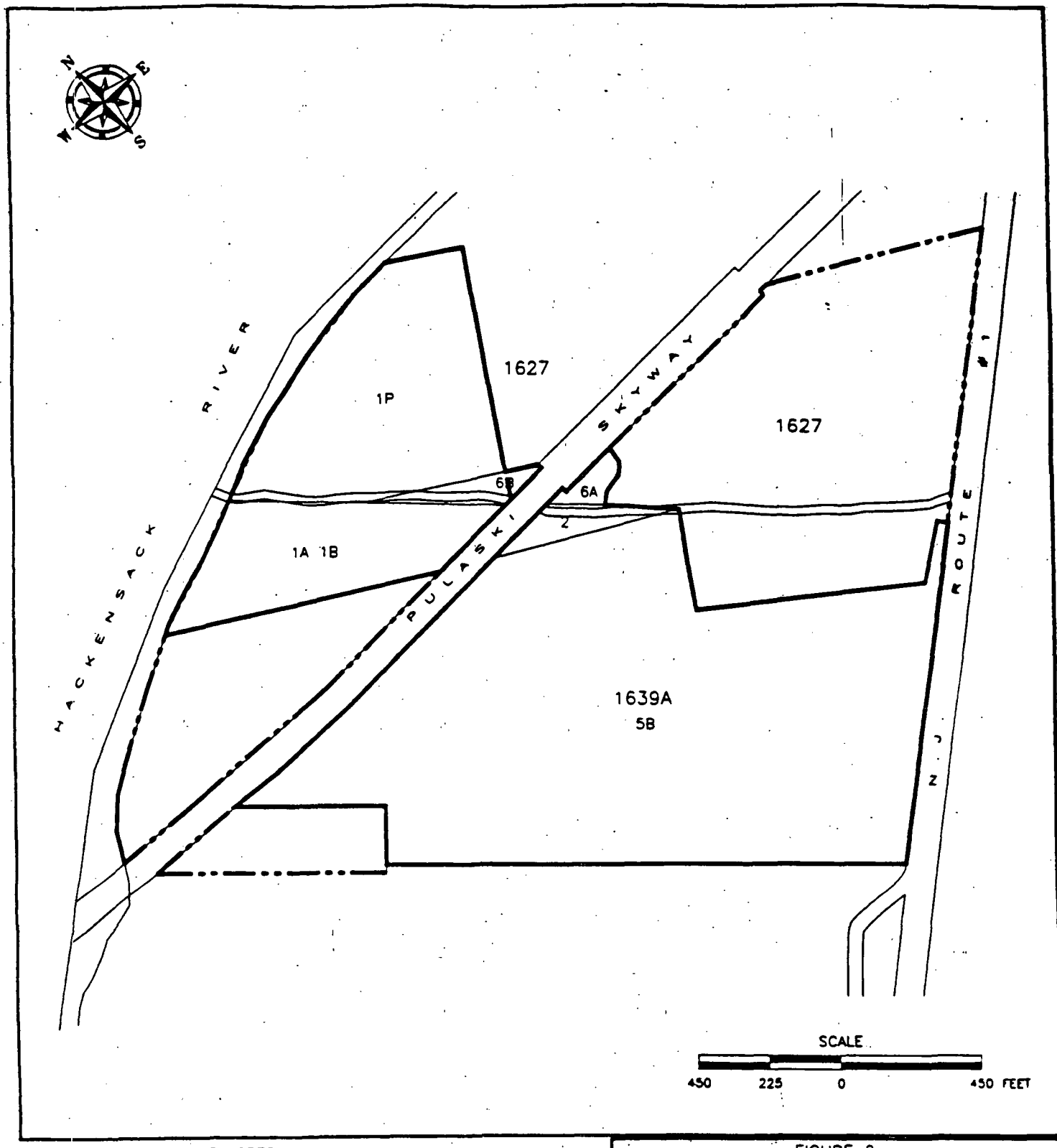
FIGURE 1

1970: APPLICATION TO OPERATE A SANITARY LANDFILL

DEFINITION OF THE SITE: PJP LANDFILL
JERSEY CITY, NEW JERSEY

McLaren Hart ENVIRONMENTAL ENGINEERING CORPORATION

DRWN: S.F.H.	CHK'D S.S.
SCALE: AS SHOWN	DATE: 10/10/94



SITE DEFINITION = 61.15 ACRES

LEGEND

"SITE" BOUNDARY–1994 PROPOSED PLAN

PJP LANDFILL

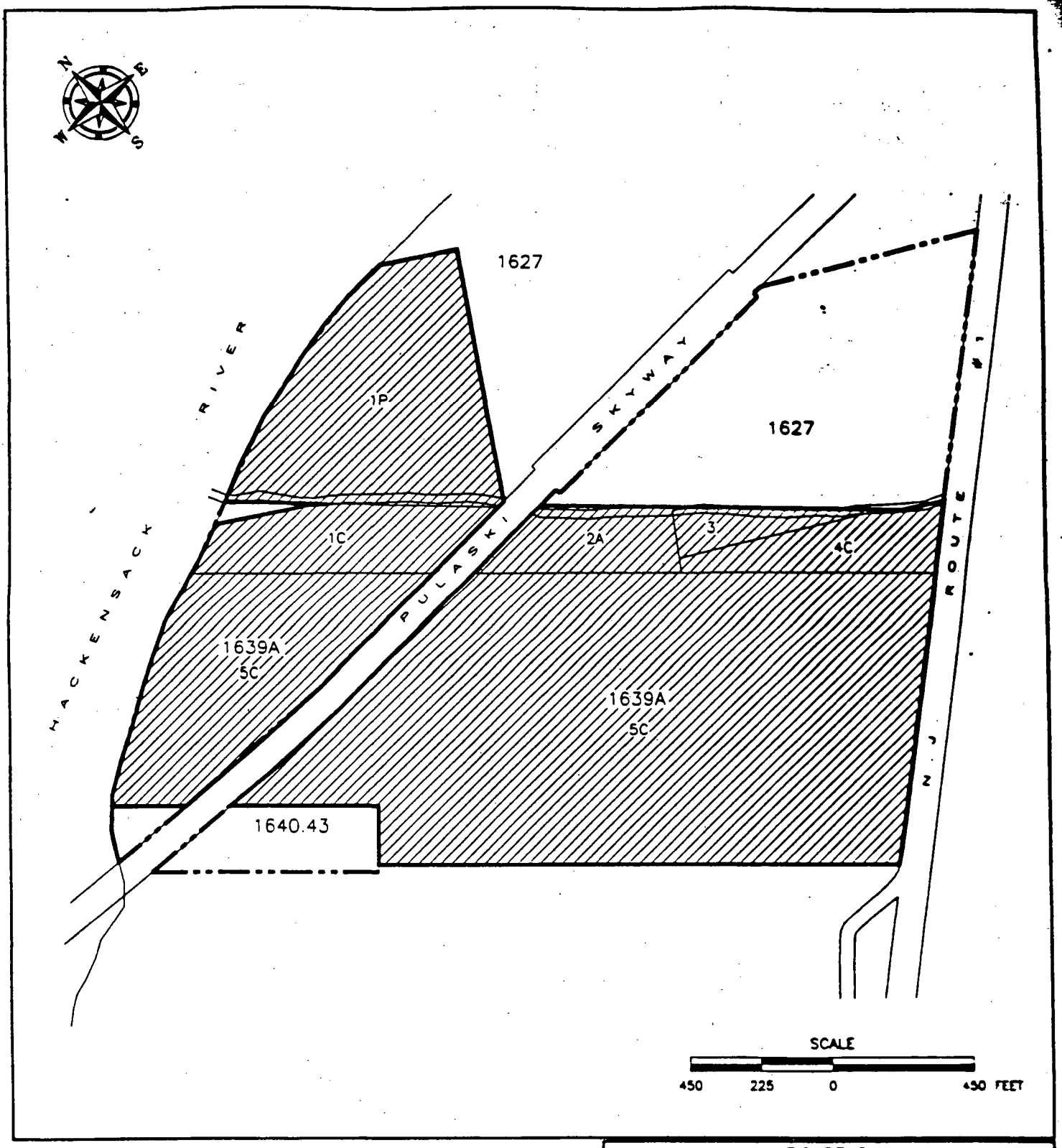
FIGURE 2

1971: NJDEPE CERTIFICATE OF REGISTRATION

DEFINITION OF THE SITE: PJP LANDFILL
JERSEY CITY, NEW JERSEY

McLaren Hart ENVIRONMENTAL ENGINEERING CORPORATION

DRWN: S.F.H.	CHK'D S.S
SCALE: AS SHOWN	DATE: 09/2[illegible] 94



SITE DEFINITION = 71.52 ACRES

LEGEND

"SITE" BOUNDARY–1994 PROPOSED PLAN

PJP LANDFILL

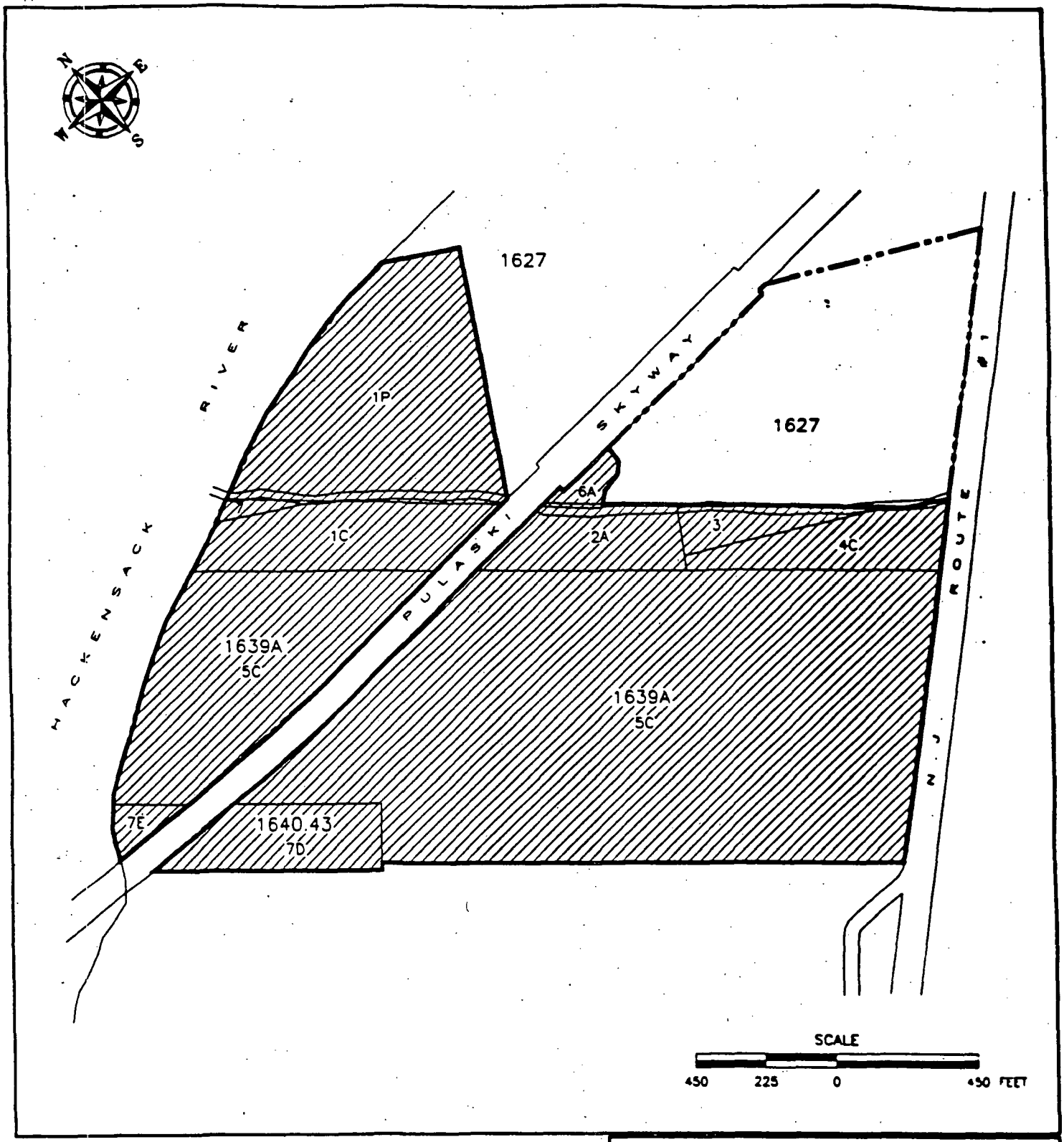
FIGURE 3

1983: RAMP

DEFINITION OF THE SITE PJP LANDFILL
JERSEY CITY, NEW JERSEY

McLaren Hart ENVIRONMENTAL ENGINEERING CORPORATION

DRWN: S.F.H.	CHKD: S.S.
SCALE: AS SHOWN	DATE: 9/94



SITE DEFINITION = 75.87 ACRES

LEGEND

"SITE" BOUNDARY–1994 PROPOSED PLAN

PJP LANDFILL

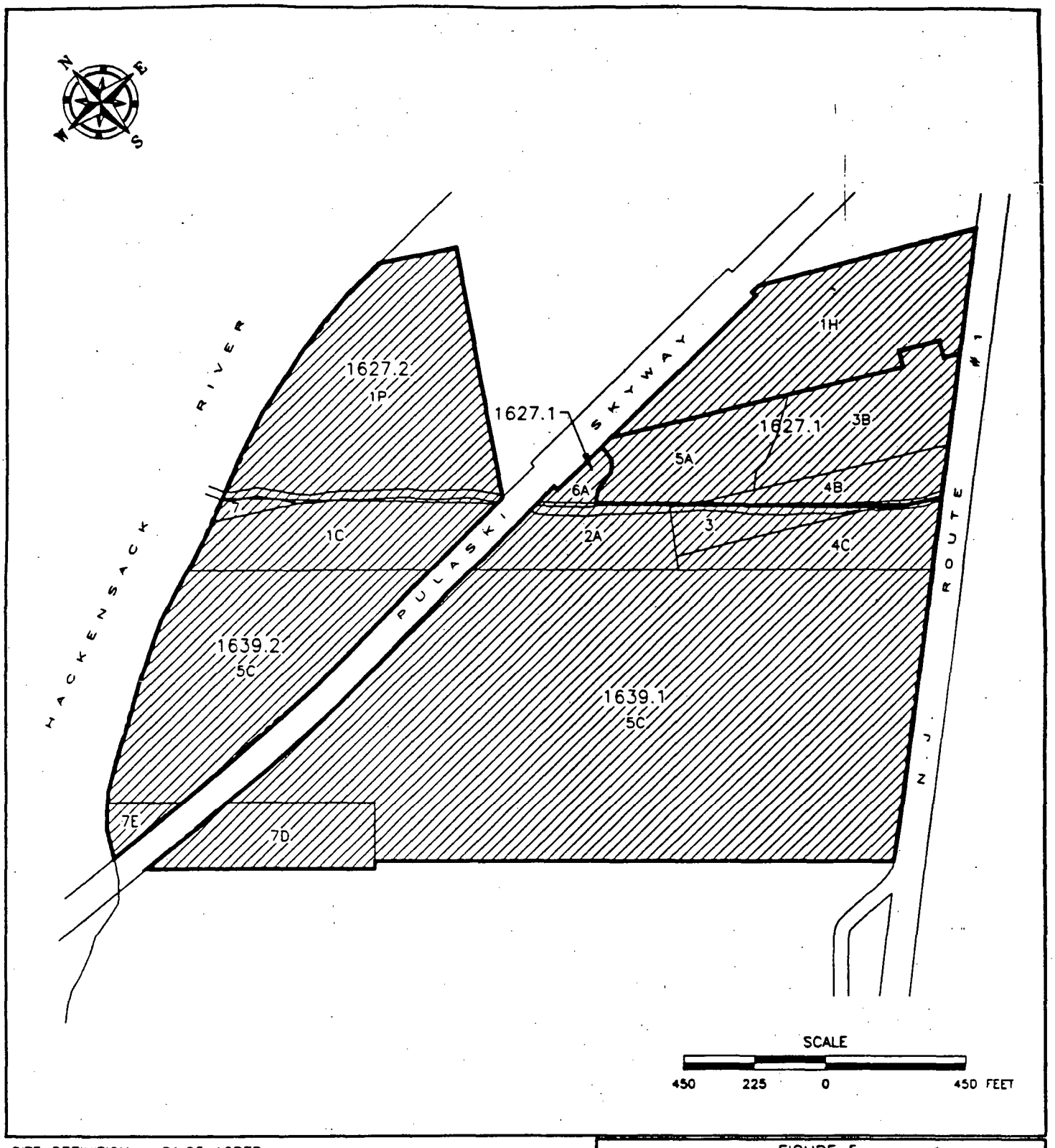
FIGURE 4

1985: IRM FINAL DESIGN REPORT

DEFINITION OF THE SITE. PJP LANDFILL
JERSEY CITY, NEW JERSEY

McLaren Hart ENVIRONMENTAL ENGINEERING CORPORATION

DRWN: S.F.H.	CHKD: S.S.
SCALE: AS SHOWN	DATE: [illegible] 94



SITE DEFINITION = 81.05 ACRES
88.75 ACRES INCLUDING LOTS 5A, 3B AND 4B

LEGEND

"SITE" BOUNDARY–1994 PROPOSED PLAN

PJP LANDFILL

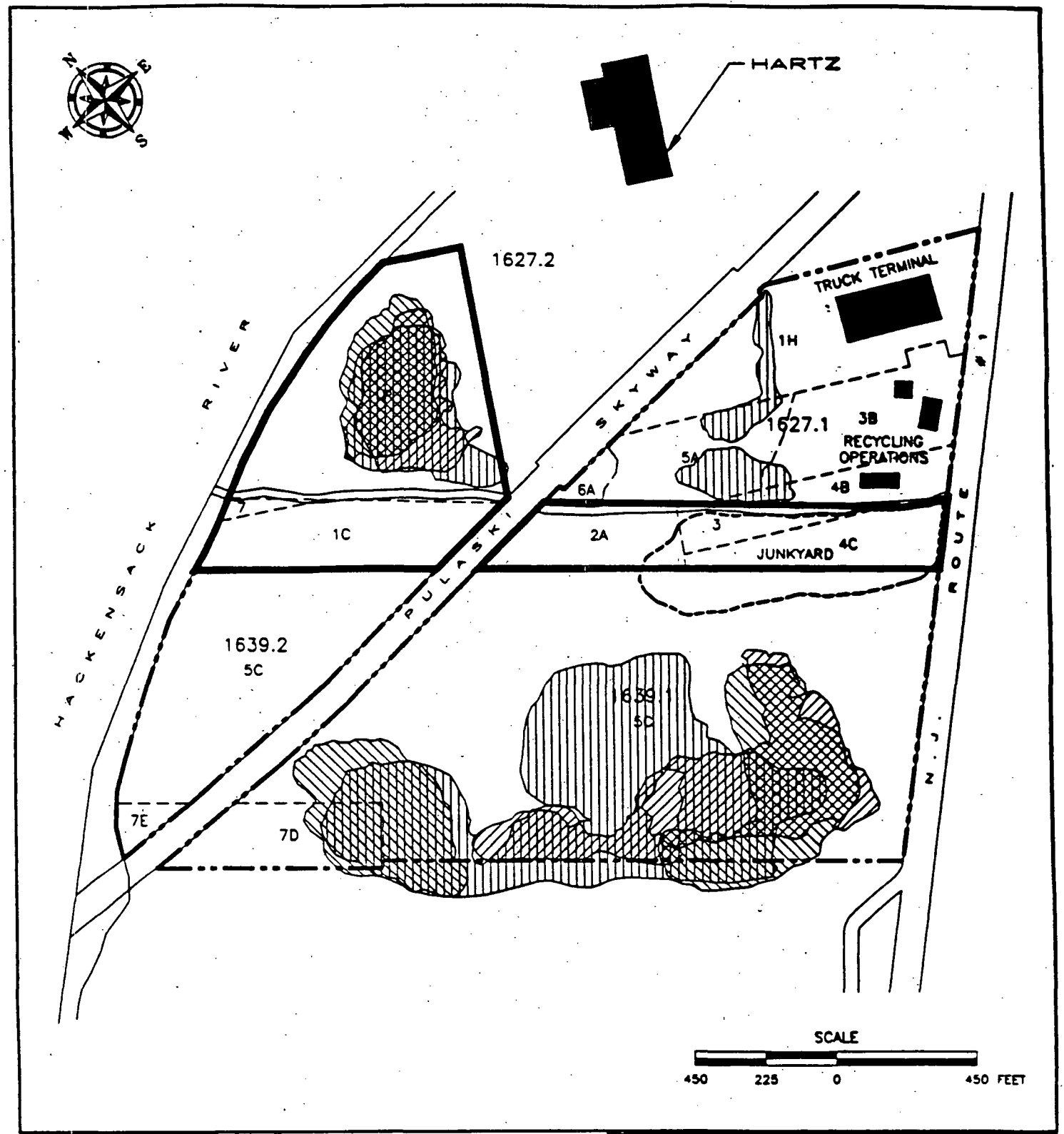
FIGURE 5

1987: NJDEP RI/FS RFP

DEFINITION OF THE SITE: PJP LANDFILL
JERSEY CITY, NEW JERSEY

McLaren Hart ENVIRONMENTAL ENGINEERING CORPORATION

DRWN: S.F.H.	CHK'D: S.S
SCALE: AS SHOWN	DATE: 10/12/94



SOURCES: AERIAL PHOTOGRAPH MARCH 31, 1957.
AERIAL PHOTOGRAPH APRIL 16, 1959.
AERIAL PHOTOGRAPH JANUARY 14, 1963.

LEGEND

- "SITE" BOUNDARY–1994 PROPOSED PLAN
- 1957 DISTURBED AREA
- 1959 DISTURBED AREA
- 1963 DISTURBED AREA
- PJP LANDFILL

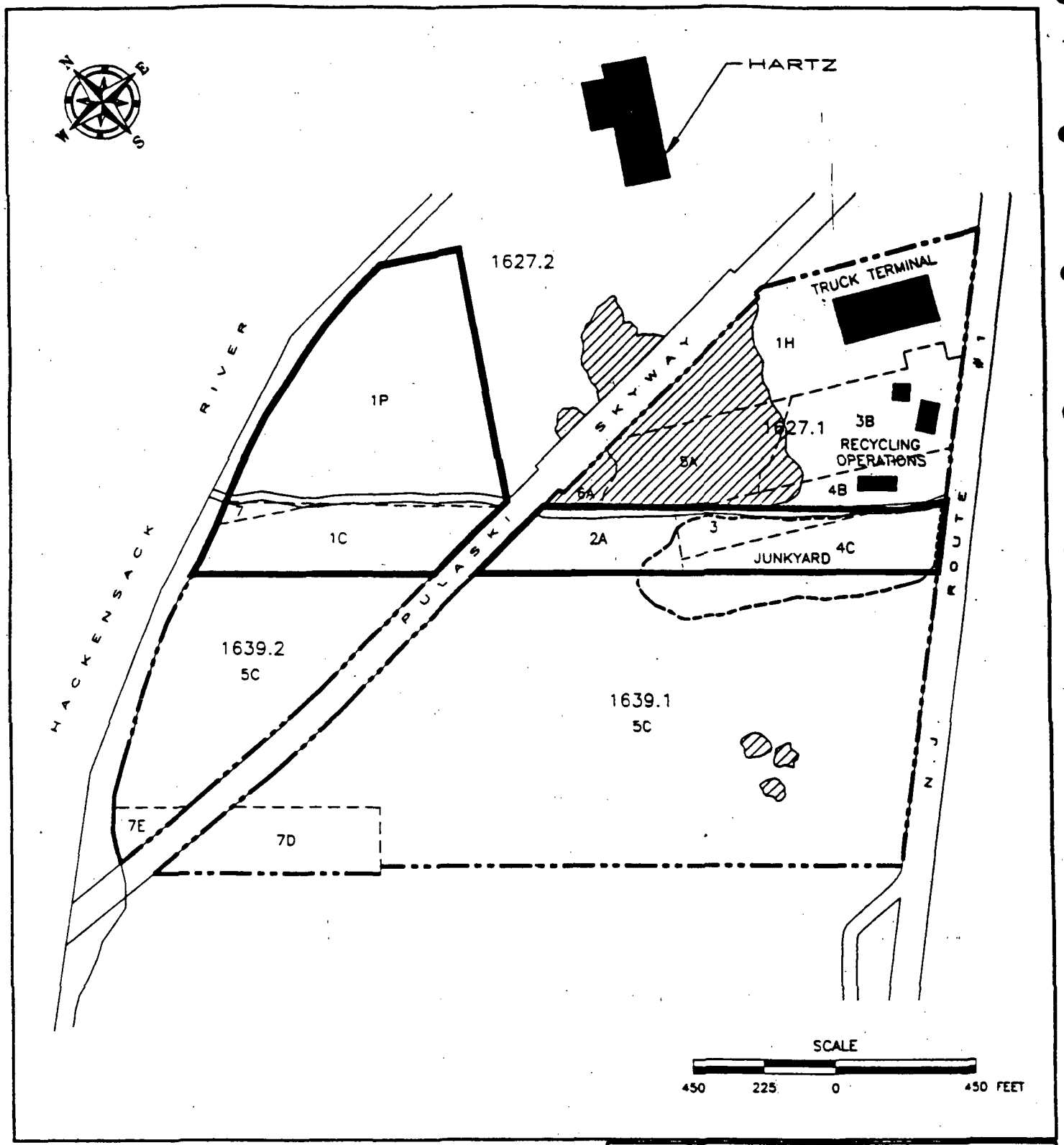
FIGURE 6

1957, 1959 AND 1963
AIR PHOTO DERIVED DISTURBANCES

LANDFILLED AREAS
JERSEY CITY, NEW JERSEY

McLaren Hart ENVIRONMENTAL ENGINEERING CORPORATION

DRWN: S.F.H.	CHK'D: S.S.
SCALE: AS SHOWN	DATE: 09/20/94



SOURCE: AERIAL PHOTOGRAPH MARCH 26, 1966.

LEGEND

- "SITE" BOUNDARY–1994 PROPOSED PLAN
- DISTURBED AREAS
- PJP LANDFILL

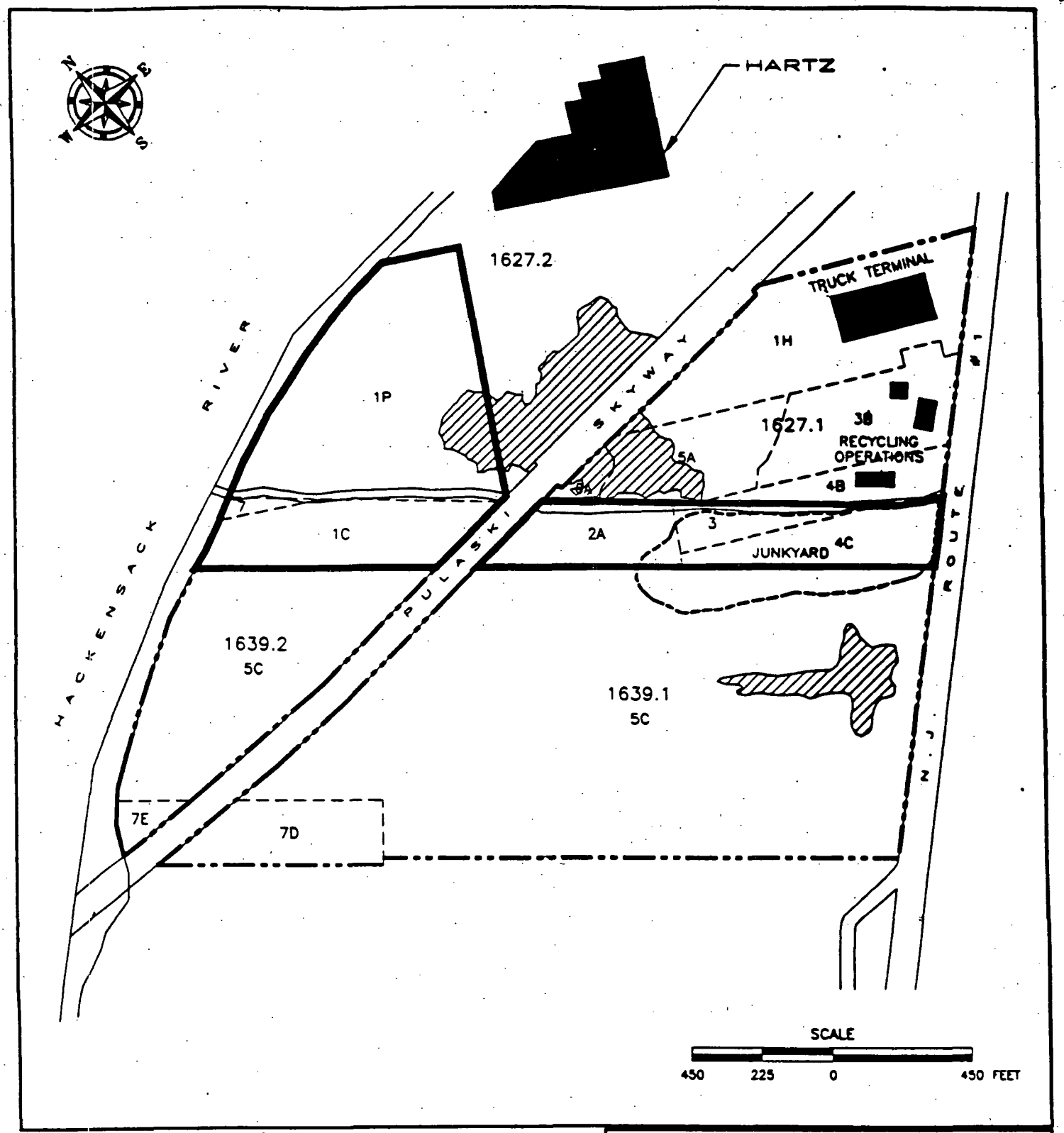
FIGURE 7

1966
AIR PHOTO DERIVED DISTURBANCES

LANDFILLED AREAS
JERSEY CITY, NEW JERSEY

McLaren Hart ENVIRONMENTAL ENGINEERING CORPORATION

DRWN: S.F.H.	CHK'D S.S
SCALE: AS SHOWN	DATE: 09/20/94



SOURCE: AERIAL PHOTOGRAPH AUGUST 11, 1968.

LEGEND

- "SITE" BOUNDARY–1994 PROPOSED PLAN
- DISTURBED AREAS
- PJP LANDFILL

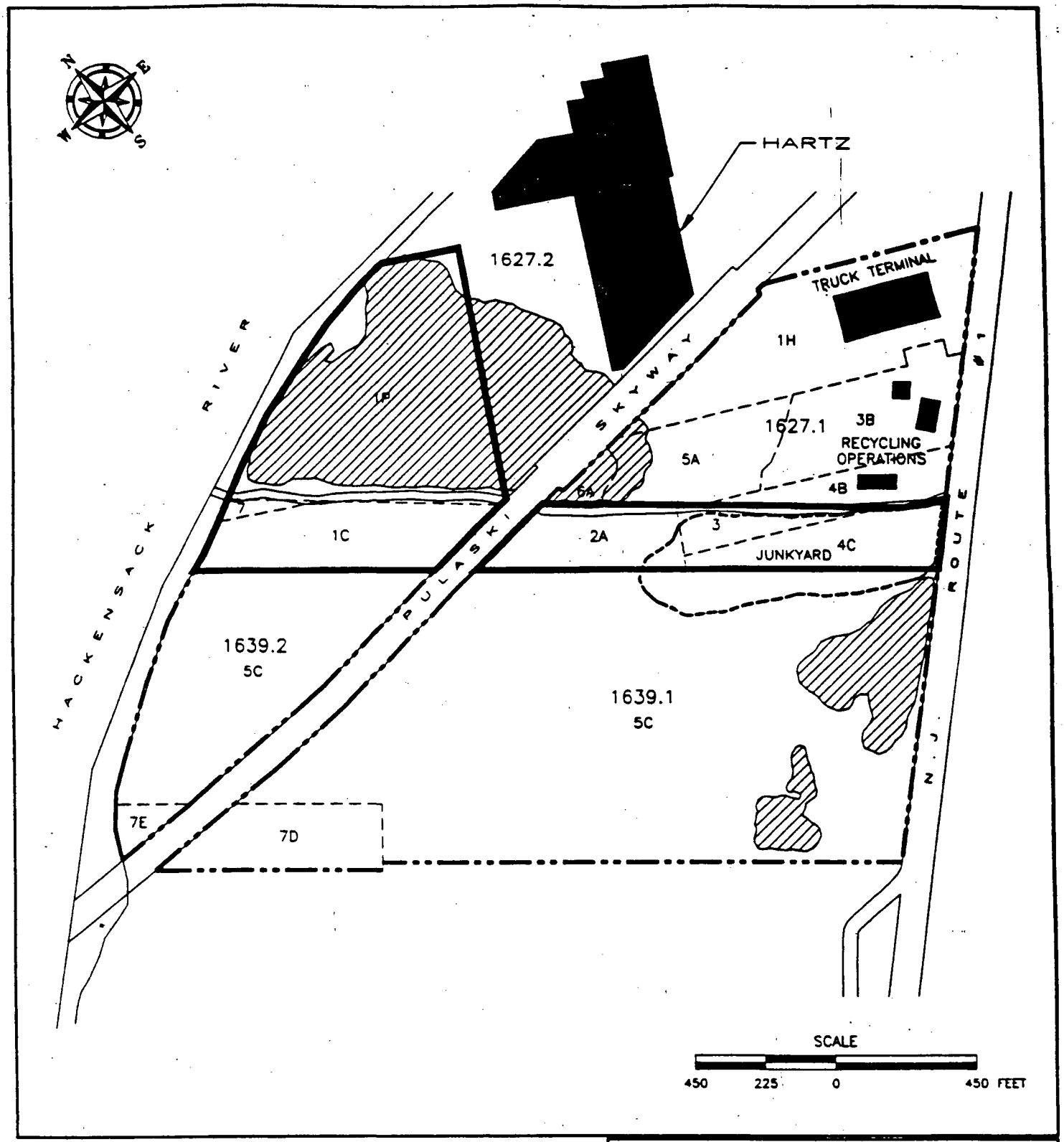
FIGURE 8

1968
AIR PHOTO DERIVED DISTURBANCES

LANDFILLED AREAS
JERSEY CITY, NEW JERSEY

McLaren Hart ENVIRONMENTAL ENGINEERING CORPORATION

DRWN: S.F.H.	CHK'D: S.S
SCALE: AS SHOWN	DATE: 09/20/94



SOURCE: AERIAL PHOTOGRAPH MAY 20, 1970.

LEGEND

- "SITE" BOUNDARY-1994 PROPOSED PLAN
- DISTURBED AREAS
- PJP LANDFILL

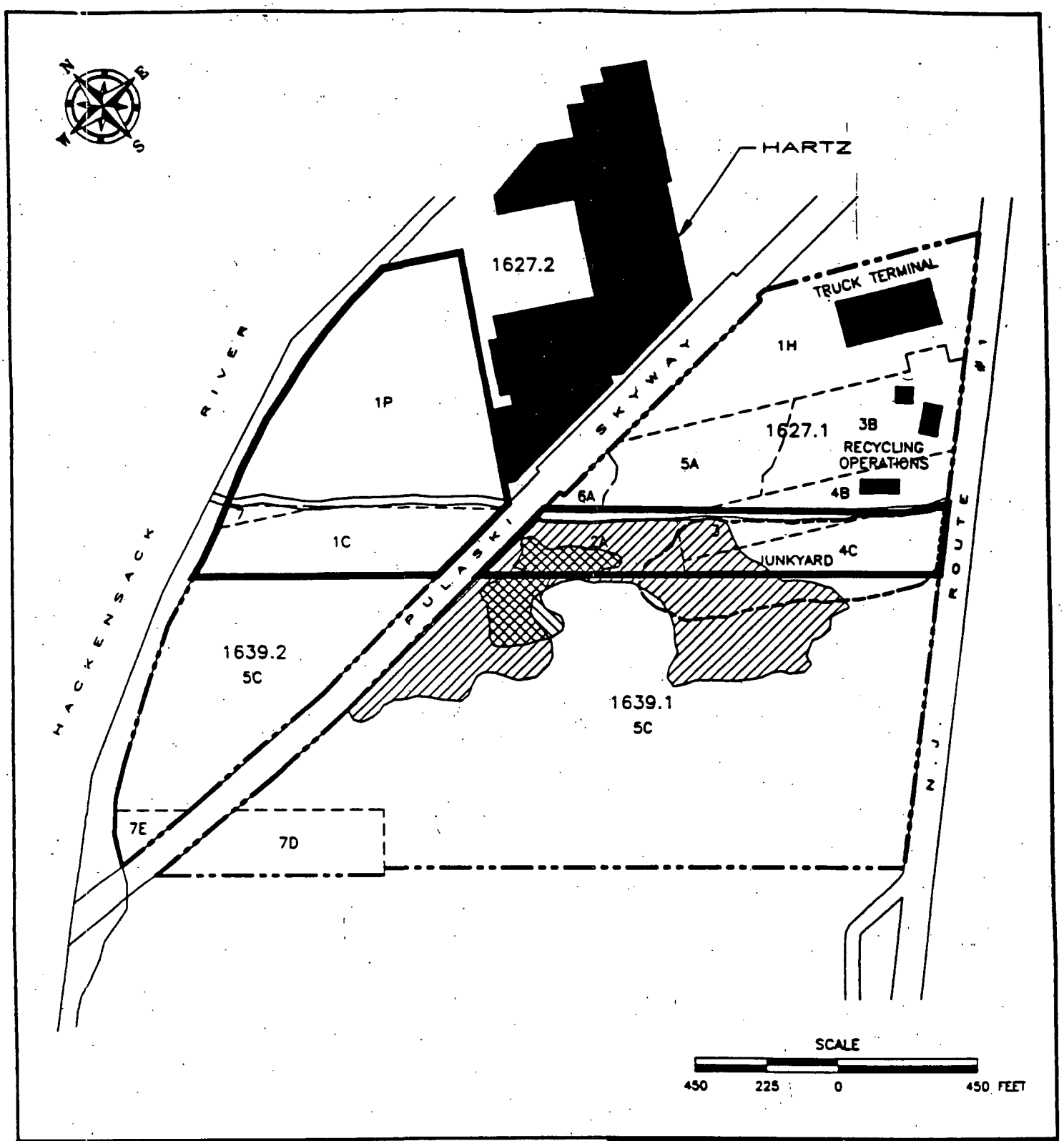
FIGURE 9

1970
AIR PHOTO DERIVED DISTURBANCES

LANDFILLED AREAS
JERSEY CITY, NEW JERSEY

McLaren Hart® ENVIRONMENTAL ENGINEERING CORPORATION

DRWN: S.F.H.	CHK'D: S.S.
SCALE: AS SHOWN	DATE: 09/20/94



SOURCE: AERIAL PHOTOGRAPHS APRIL 9, 1977 AND NOVEMBER 7, 1982.

LEGEND

- "SITE" BOUNDARY-1994 PROPOSED PLAN
- 1977 DISTURBED AREA
- 1982 DISTURBED AREA
- PJP LANDFILL

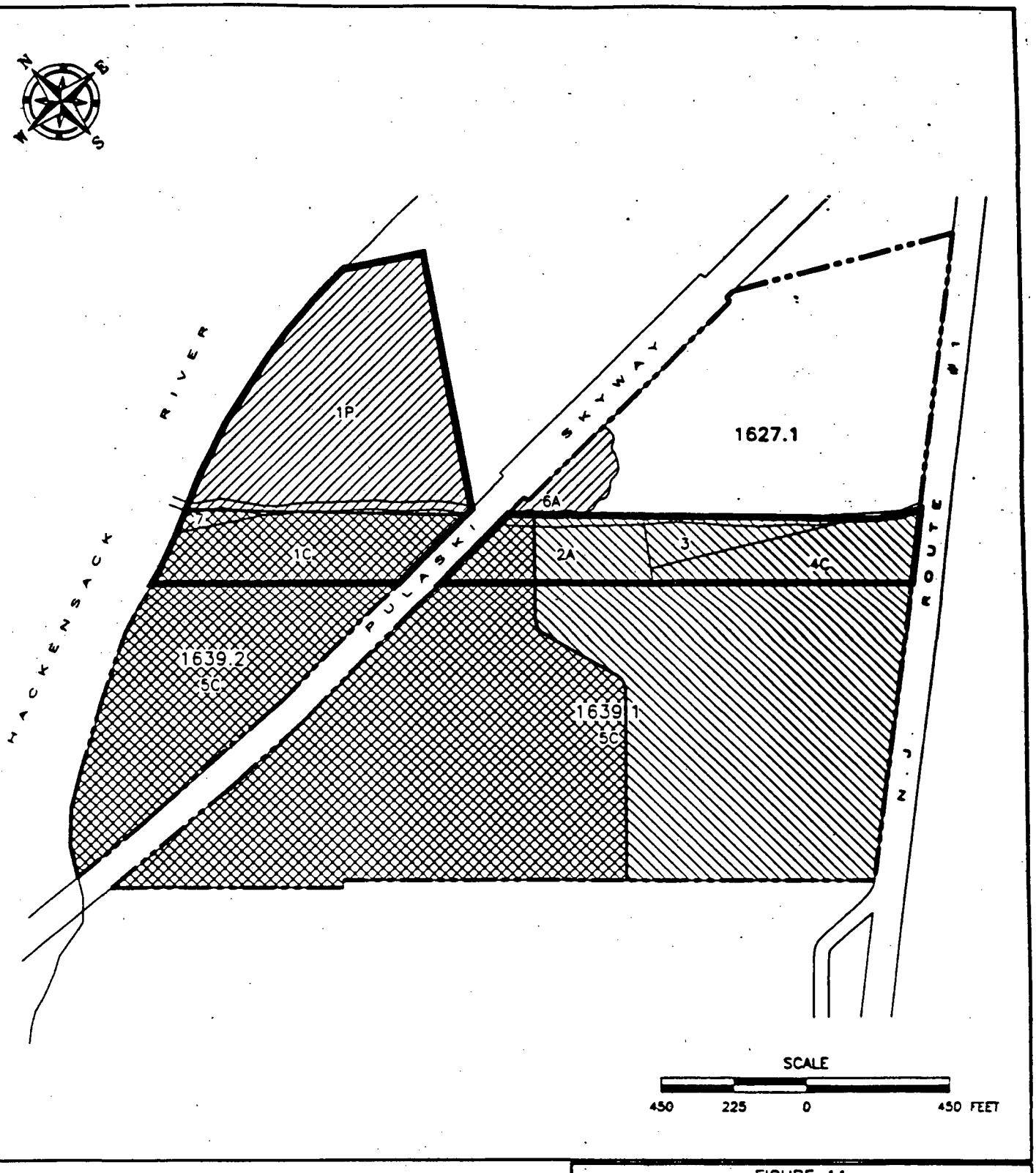
FIGURE 10

1977 AND 1982
AIR PHOTO DERIVED DISTURBANCES

LANDFILLED AREAS
JERSEY CITY, NEW JERSEY

McLaren Hart ENVIRONMENTAL ENGINEERING CORPORATION

DRWN: S.F.H.	CHK'D: S.S.
SCALE: AS SHOWN	DATE: 09/20/94



LEGEND

- "SITE" BOUNDARY–1994 PROPOSED PLAN
- GEOMEMBRANE COVER – APPROX. 13 ACRES
- ASPHALT COVER – APPROX. 21 ACRES
- EXISTING IRM CAPPED AREA
- PJP LANDFILL

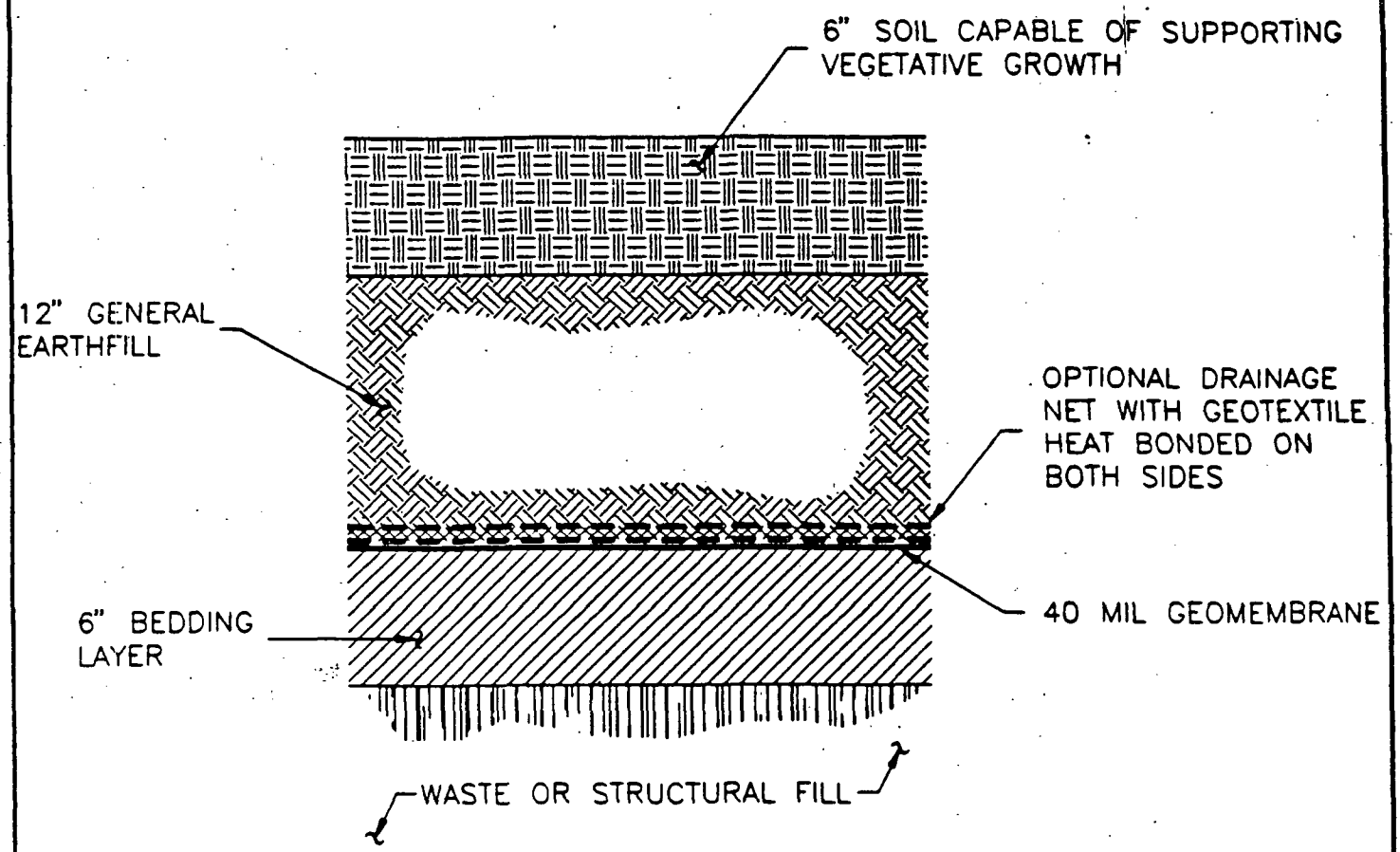
FIGURE 11

PROPOSED AREAS TO BE CAPPED

ALTERNATIVE REMEDY: PJP LANDFILL
JERSEY CITY, NEW JERSEY

McLaren Hart ENVIRONMENTAL ENGINEERING CORPORATION

DRWN: S.F.H.	CHK'D: S.S.
SCALE: AS SHOWN	DATE: 10/[illegible] 94



PROPOSED MODIFIED GEOMEMBRANE CAP

LOTS 6A AND 1P

N.T.S.

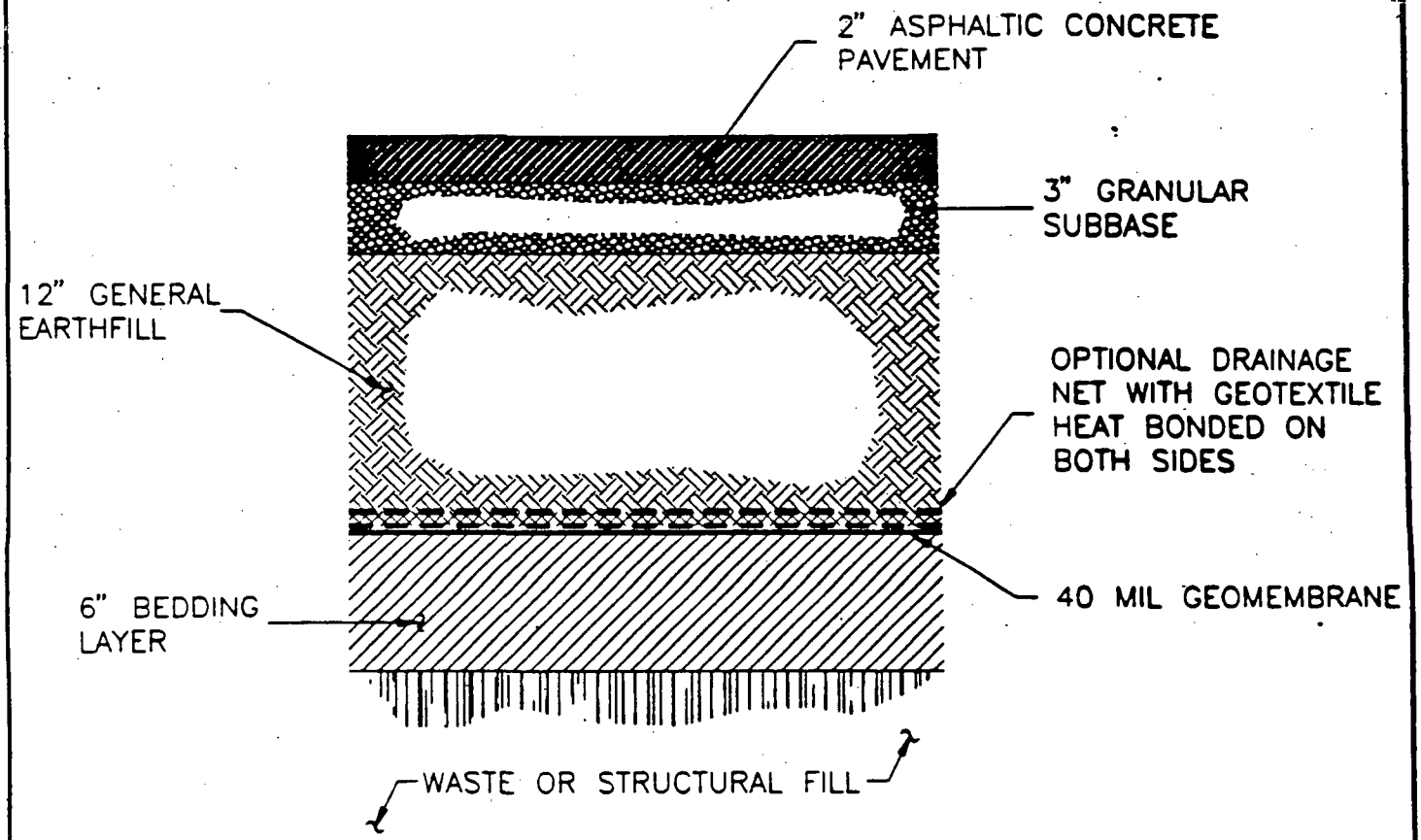
FIGURE 12

TYPICAL X-SECTION VIEW

PJP LANDFILL
JERSEY CITY, NEW JERSEY

McLaren Hart ENVIRONMENTAL ENGINEERING CORPORATION

DRWN: PITTSBURGH, PA	CHK'D. B M
NOT TO SCALE	DATE. 09/21/94



PROPOSED ASPHALT/GEOMEMBRANE CAP

LOTS 2A, 3, 4C AND 5C

N.T.S.

FIGURE 13

TYPICAL X-SECTION VIEW

PJP LANDFILL
JERSEY CITY, NEW JERSEY

McLaren Hart ENVIRONMENTAL ENGINEERING CORPORATION

DRWN: PITTSBURGH, PA	CHK'D BY
NOT TO SCALE	DATE 9/94

CARPENTER, BENNETT & MORRISSEY

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139405

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KAREN L. MAYER
ARLENE S. HONG
DEBORAH L. NEILAN
JOHN M. O'CONNOR
DAVID A. COHEN

October 14, 1994

VIA TELECOPY AND REGULAR MAIL

Donald J. Kakas, Acting Chief
Bureau of Community Relations
Site Remediation Program
Department of Environmental Protection
CN 413
Trenton, NJ 08625-0413

RE: PJP Landfill

Dear Mr. Kakas:

As you may know, we represent eleven defendants in the lawsuit brought by the NJDEP for past and future costs associated with the remediation of the PJP Landfill in Jersey City, New Jersey. I am writing to comment on the Department's Proposed Remedial Action Plan ("PRAP") for the Site. As my clients are all members of the PJP PRP Group (the "Group"), I am submitting these comments as a supplement to those of the Group.

The starting point of any proposal for future remedial work at the PJP Landfill should be the Interim Remedial Measure ("IRM") which the Department performed in the mid-1980s. The IRM focused on the most heavily contaminated areas of the Site. Although a more narrowly focused, less costly alternative could have achieved the same result, the Department has offered no evidence that the IRM was unsuccessful in protecting human health and the environment in those areas of the Site which it addressed. In light of this fact, it is unclear why the Department is now proposing a remedy for the comparatively less hazardous areas of the PJP Landfill which in many respects is far more extensive and costly than the work done during the IRM.

One of the more prominent examples of this unexplained departure from the construction methods and designs of the IRM is the proposal to install a multi-layer cap over those areas of the Site unaddressed by the IRM. In choosing such a design the Department has offered no evidence, nor has it suggested, that the existing single-layer construction is inadequate. Presumably, if the current cap design has proven effective for the more seriously contaminated areas of the Site, it should be equally if not more effective in the remaining, less-contaminated sections. Therefore, there is no apparent reason why a similar single-layer design should not be used in any future construction of a cap at the Site.

There are other aspects of the PRAP which, quite apart from the IRM, are unnecessary at this Site. An obvious example is the Department's proposal to construct a 15-foot diameter culvert pipe in the Sip Avenue ditch in order to prevent contaminants from the landfill from leaching into the ditch where they could be washed into the Hackensack River. A more cost-effective way to achieve that goal would be to seal the ditch by installing a geomembrane/rip-rap construction on its surface. Such a seal would form an effective barrier between the water flowing through the ditch and any contaminants migrating from the landfill. It would also result in the accumulation of new sediment, restoring former wetlands. This alternative could save as much as $7 million from the cost of the future remedy. Moreover, unlike the existence of 15-foot, open-ended pipe on the Site, a geomembrane/rip-rap seal would not pose a potential hazard to trespassers such as children intent on exploring a large and alluring tunnel.

Finally, there is no reason why the area east of the existing IRM cap should not be paved with asphalt rather than capped. Information about the history of the PJP landfill indicates that this area, which is relatively flat, was used primarily as a staging area for drums and other containers prior to disposal. Therefore, the risk that rainwater will cause hazardous substances to migrate through soil erosion or the leaching of contaminants into the groundwater is minimal in this part of the Site. Absent such a risk it is difficult to understand how a multi- or even single-layer cap would be more protective of human health and the environment than asphalt pavement. Moreover, one of the Site owners has already paved another portion of the Site without objection or comment from NJDEP, implying that the Department has accepted paving as an alternative to capping.

The paving of this area could benefit the community in other ways as well. Since the area is relatively uncontaminated, a flat paved surface would offer an ideal location for the construction of basketball courts and other sporting facilities which are currently in short supply in the neighborhood. Moreover, the existence of such facilities would greatly diminish the likelihood that the remainder of the Site would pose an attractive nuisance to children looking for a place to play.

The goal of any future remedial action at the PJP Landfill is to protect human health and the environment in the most cost-effective manner possible. Our clients believe that the alternatives to the PRAP which I have discussed in brief here, and which the Group sets forth in more detail in its comments, are better tailored to achieving that goal than the design which the Department is currently proposing. If you are interested in discussing these alternatives further, we would welcome the opportunity. You can contact me directly at 201-565-2014.

Thank you.

Very truly yours,

CARPENTER, BENNETT & MORRISSEY

BY: John F. Lynch, Jr.

JFL:291:do
cc: (Regular Mail)

Frank Cardiello, Esq., Deputy
Attorney General
Patricia E. Stern, Esq., Deputy
Attorney General
PJP PRP Group

NEW JERSEY GENERAL ASSEMBLY
DEMOCRATIC OFFICE
STATE HOUSE - SOUTH WING, SUITE LA40
CN-098
TRENTON, NEW JERSEY 08625-0098
(609) 292-7065

HONORABLE JOSEPH V. DORIA, JR.
ASSEMBLY DEMOCRATIC LEADER

FREDERICK F. BUTLER
EXECUTIVE DIRECTOR

August 22, 1994

The Honorable Robert Shinn
Department of Environmental Protection
CN 402
Trenton, NJ 08625

Dear Commissioner Shinn,

On behalf of the entire Hudson County Delegation, I just wanted to commend the department on a job well done for the public meeting held on August 18, 1994 to discuss the remediation plan for the capping of the rest of the PJP Landfill.

In my estimation, the preferred plan of action presented by the Department of Environmental Protection was met with acceptance by the community. The citizens I have spoken with in that area appreciate that the Sip Avenue drainage ditch will be reconstructed and changed to minimize any hazards. Moreover, the removal of drums and associated soils will also provide solace to the residents of the area. We are pleased that progress is being made in the final remediation of this plan.

However some outstanding issues need to be resolved. Residents of the community are interested in the possible uses of this land in the future? Additionally, an attorney from one of the potentially responsible parties said new illegal dumping may have occurred. I would like to see this allegation investigated to determine the accuracy. Finally, the community would like to know if the Lincoln Park West area has been affected by runnoff from the landfill. If there is a problem, we would be interested in learning whether or not it is related to the PJP Landfill in any form.

I appreciate your consideration of these matters. If I can be of any assistance please feel free to contact me or my staff.

Sincerely,

Joseph V. Doria, Jr.
Assembly Democratic Leader

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ROBERT J. YARBROUGH

OF COUNSEL
PAUL G. SHAPIRO*Δ

* ADMITTED IN NEW JERSEY
Δ ADMITTED IN NEW YORK
† NOT ADMITTED IN PENNSYLVANIA

DIRECT DIAL: (609) 895-6208

REPLY TO: Lawrenceville

RECEIVED
AUG 11 1994

August 10, 1994

Donald J. Kakas, Acting Chief
Bureau of Community Relations
Site Remediation Program
Department of Environmental Protection
CN 413
Trenton, New Jersey 08625-0413

VIA TELECOPY AND CERTIFIED MAIL, RETURN RECEIPT REQUESTED

RE: **PJP Landfill Superfund Site:**
Extension of the Comment Period regarding the Proposed Plan

Dear Mr. Kakas:

I am writing to you on behalf of the PJP PRP Group (the "Group") to request an extension of the public comment period regarding the Proposed Plan for remedial alternatives (the "Plan") for the PJP Landfill Superfund Site.

The Plan states that the public comment period begins on August 2, 1994 and concludes on August 31, 1994. The Plan further informs the public that the Administrative Record File is available at NJDEP and that copies of the Plan and supporting documentation can also be obtained from the Jersey City Public Library and the Jersey City Municipal Building. However, the Group has not yet been provided with all of the supporting documents and the Administrative Record File.

Accordingly, pursuant to the National Contingency Plan, 40 C.F.R. § 300.430(f)(3)(i)(C), the Group requests an extension of the public comment period by a minimum of thirty (30) additional days, *i.e.*, until **Friday, September 30, 1994** in order to obtain and review all supporting documents and the Administrative Record File, and to submit any comments to the Plan. If the Group is not able to timely obtain the complete set

of supporting documents and the Administrative Record File, the Group requests a further thirty day extension, to run from the date that we receive all such records.

Please contact me at your earliest convenience with your response to this request.

Very truly yours,

Roxanne E. Jayne

cc: Francis X. Cardiello, Deputy Attorney General
(via telecopy and regular mail)
PJP PRP Group members
(via regular mail)

State of New Jersey

DEPARTMENT OF ENVIRONMENTAL
PROTECTION AND ENERGY

CHRISTINE TODD WHITMAN
Governor

ROBERT C. SHINN, JR.
Commissioner

AUG 17 1994

Roxanne E. Jayne
Cohen, Shapiro, Polisher, Sheikman and Cohen
Princeton Pike Corporate Center
1009 Lenox Drive - Building Four
Lawrenceville, New Jersey 08648

Re: PJP Landfill Superfund Site

Dear Ms. Jayne:

I am writing in response to your August 10, 1994 letter requesting an extension of the public comment period on the Proposed Plan for remediation of the PJP Landfill Superfund site.

In accordance with the National Contingency Plan, the comment period, which initially ended on August 31, 1994, will be extended by thirty (30) days, at your request, until September 30, 1994. In addition to this letter, the extension of the comment period will be announced at the August 18, 1994 public meeting in Jersey City.

If you have any questions regarding this matter, please call me at (609) 984-3081.

Sincerely,

Donald J. Kakas

Donald J. Kakas, Acting Chief
Bureau of Community Relations

c: Frank Cardiello, Deputy Attorney General

State of New Jersey
DEPARTMENT OF LAW AND PUBLIC SAFETY
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September 27, 1994

Pamela S. Goodwin, Esq.
Saul, Ewing, Remick & Saul
One State Street Square
Suite 1104
50 West State Street
Trenton, NJ 08608

Re: PJP Superfund Site

Dear Pamela:

This will confirm our conversation of September 26, 1994 at which time I advised that the public comment period for the proposed plan regarding PJP Landfill has been extended.

The comment period was originally extended 30 days from August 30th to September 30, 1994, at the request of members of the PJP PRP group. While both EPA and DEP were reluctant to further extend the comment period, they have agreed to an additional two weeks beyond September 30th for comments to be sent regarding the proposed plan for the PJP Superfund Site. The comment period has therefore been extended to close of business on October 14, 1994.

Thank you for your attention to this matter.

Very truly yours,

Frank

Frank X. Cardiello
Deputy Attorney General

FXC:sg